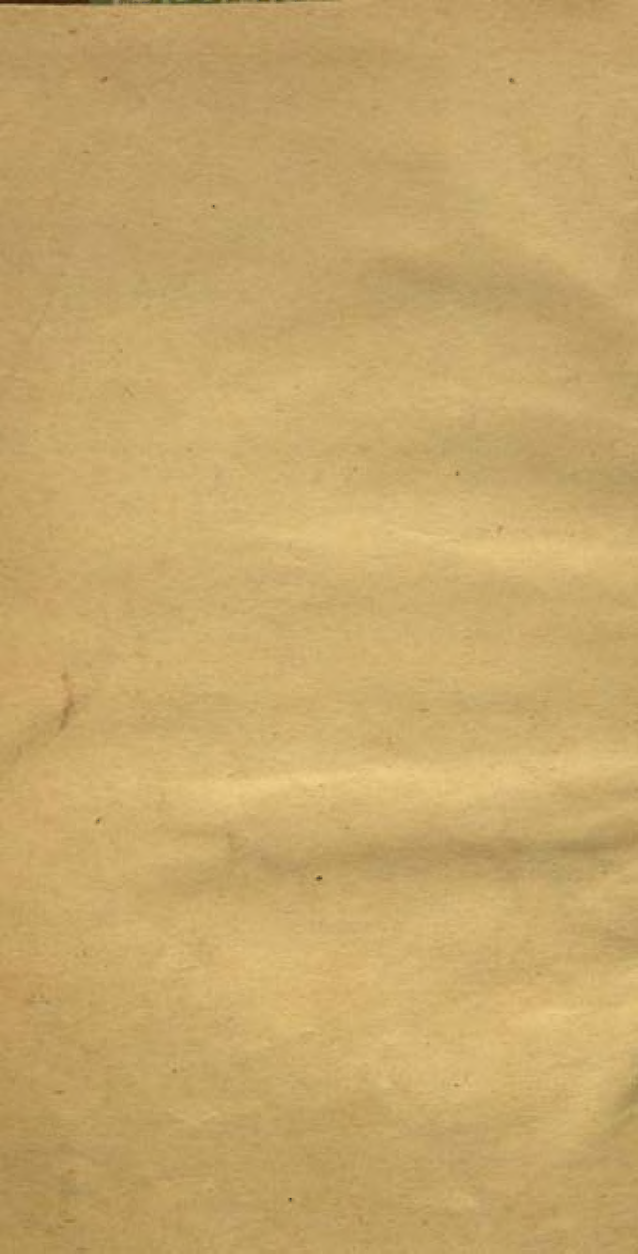



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THE INDUS CIVILIZATION

The Indus Civilization

by
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LOVAT DICKSON & THOMPSON LTD.
PUBLISHERS
LONDON

First published 1935

LOVAT DICKSON & THOMPSON LTD. 38 BEDFORD STREET LONDON
AND ST. MARTIN'S HOUSE BOND STREET TORONTO

SET PRINTED AND BOUND IN GREAT BRITAIN
BY RICHARD CLAY AND SONS LIMITED AT THE CHAUCER PRESS BUNGAY
PAPER MADE BY W. ROWLANDSON & COMPANY LIMITED
SET IN BASKERVILLE MONOTYPE

TO

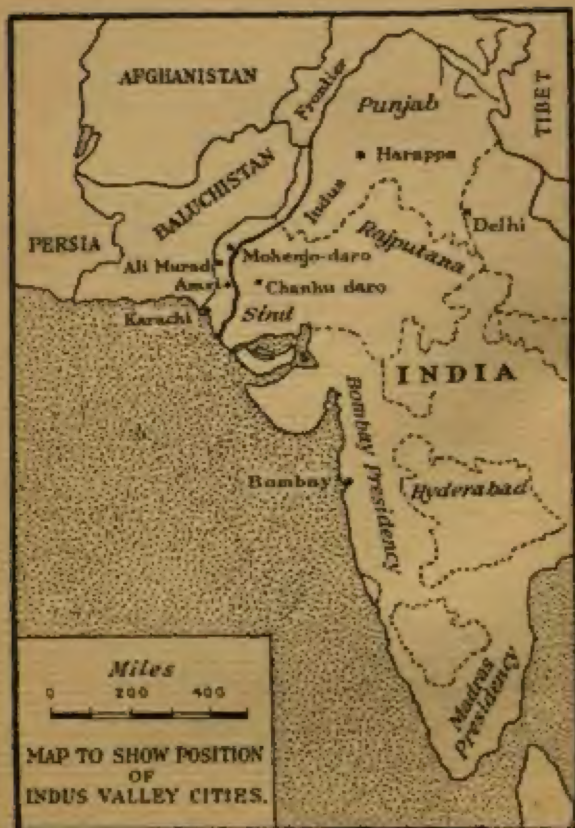
MY WIFE

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THE INDUS CIVILIZATION



MAP TO SHOW POSITION OF INDUS VALLEY CITIES.

I

THE INDUS CIVILIZATION

THE remains of the ancient city of Harappa are situated in the Montgomery district of the Punjab and lie beside what was once the bed of the Ravi before that river shifted its course. On this site seals had been found from time to time during the last few decades, and it has always been suspected that these seals, most of which bore the incised figure of an animal surmounted by pictographic signs, dated from very early times; indeed, Sir Alexander Cunningham went so far as to say that the Brahmi alphabet of India was derived from this unknown script, a theory in which he is now supported by Professor Stephen Langdon.

Harappa, at that time the only site known to contain traces of this as yet unknown Indian civilization, had, unfortunately, served until recent years not only as a brick quarry for the neighbouring towns and villages, but even as a source of railway ballast, and it was, in consequence, difficult to obtain any clear plan of the

houses and other buildings. Accordingly, Sir John Marshall, then Director-General of Archæology in India, determined to discover another site where the remains of this civilization might be investigated, and eventually found it in the mounds of Mohenjo-daro, about twenty-five miles south of Larkana, in middle Sind.

The credit of realizing the prehistoric nature of this very fine site must be given to Mr. R. D. Banerji, who came upon it in 1922 when excavating a Buddhist stupa and monastery erected somewhere between 150 and 300 A.D. These Buddhist buildings, which were of burnt brick, save for the drum of the stupa of unburnt brick, stood on the loftiest part of the site, a mound which Mr. Banerji found to be composed of the masonry and material of the much earlier culture now termed the Indus civilization. Even the burnt bricks used by the Buddhist monks dated from those early times, for they had been dug out and made to serve again some twenty-six centuries later. The reports from Mohenjo-daro were so encouraging that Sir John Marshall resolved to carry out more extensive operations, especially as the work of Rai Bahadur Daya Ram Sahni at Harappa in 1921 had proved that that site, at

any rate, was without doubt an extremely early one.

Mr. M. S. Vats was accordingly deputed to make further investigations at Mohenjo-daro in the winter of 1923–4, and the following season fresh excavations were carried out by Mr. K. N. Dikshit. In 1925–6, an increase in the funds available for the work enabled Sir John Marshall to gather together a larger staff, including Mr. H. Hargreaves and Mr. Sana Ullah, and these more extensive operations, which were supervised by the Director in person, produced a great deal of most interesting material as well as the plans of many buildings.

The following autumn Rai Bahadur Daya Ram Sahni and the writer together resumed excavations at other parts of the site, and from that time until financial troubles put an end, in 1931, to archæological exploration in India, the investigation remained in the latter's charge. Meanwhile, the work at Harappa proceeded on a smaller scale under Mr. M. S. Vats, while Mr. N. G. Majumdar toured Sind in search of further sites. This latter work proved most successful, for settlements of the Indus Valley civilization were discovered in many places in that province, from the modern city of Hyderabad in the south nearly to

Jacobabad in the north; they form a long chain of mounds between the present course of the Indus and the foothills of the Khirthar Range in Baluchistan, and include a very large city built of unburnt brick close to the eastern bank of the river. Only a brief examination of these mounds has yielded evidence of a yet earlier culture in some of them, lying beneath the remains left by the Indus Valley people when they deserted these sites, which, it should be mentioned, were not occupied again in later times. Of this earlier culture, named the Amri culture (after the site at which it was first discovered in Sind), we know but little; but its pottery, both in its shapes and the geometric designs painted on it in two colours, differs radically from the Indus Valley ware and is clearly the work of a different people.

In 1925, Mr. Hargreaves explored, among other sites, a large mound at Nal, in the Kalat State of Northern Baluchistan, and found there evidences of a culture whose connection with that of the Indus Valley people has yet to be determined. Two years later, Sir Aurel Stein travelled through Northern and Southern Baluchistan to ascertain whether the Indus culture had penetrated to those regions and, in the course of two arduous campaigns, was

rewarded by the discovery of an abundance of contemporary and even earlier remains.

Traces of the occupancy of the Indus Valley people have also been detected at Rupar, a small settlement on the Sutlej, not far from the Simla Hills, and there can be no doubt that other sites farther east and south of Harappa will eventually come to light; in fact, Sir John Marshall is confident that this culture spread to, even if settlements were not actually made in, the Ganges valley. As it is, Harappa lies more than four hundred miles north-east of Mohenjo-daro, while some of the sites in Southern Baluchistan, where pottery of definite Indus Valley make has been found, are as much as one hundred and fifty miles away to the west. The discovery of this pottery, however, does not establish the fact that the civilization which built Mohenjo-daro and Harappa penetrated into Baluchistan to any large extent, and further excavations in that very arid province will be necessary before this point can be settled. It is known that the Indus Valley people carried on a thriving trade with their neighbours, so it is quite possible that some of the commodities they exported were contained in pottery vessels which found their last home on the rubbish-heaps of the Balu-

chistan settlements. At all events, it can be assumed that the Indus Valley civilization extended south and east of Harappa; as Professor Childe has pointed out, it must have embraced an area immensely larger than either Egypt or Sumer.

Mohenjo-daro seems to have been a smaller city than Harappa, but even so, it occupies a square mile of ground. It may have been larger than appears, for its outskirts are buried beneath the silt deposited by the River Indus. As this city is by far the better preserved of the two, it was here that the material in this book was largely gathered, but it must be borne in mind that, save for some objects of obviously later date, the finds at Harappa are practically identical with those at Mohenjo-daro. Their pottery, for example, is the same in most of the shapes and the designs painted upon it; the seal-amulets incised with animals and signs might have come from either site, and though there is a feeling that Harappa is slightly older than Mohenjo-daro, there is little definite evidence to support it. The script seems to have remained the same throughout the period of occupation of either city; it retained its pictographic character right up to the time of their abandonment.

Owing, however, to the fact that the bed of the Indus has risen some twenty feet or more in the course of the ages, it is impossible without very costly pumping machinery to explore the earliest levels of Mohenjo-daro; in one place, where the excavations have penetrated forty feet below the surface of one of the principal mounds, the objects found were identical with those of the later levels. Below this limit digging cannot continue, although it is obvious that the walls descend to yet lower levels in the now water-logged soil, and there is no doubt that the foundations of the city are of a much earlier date than the levels it has been possible to reach; yet there is no reason to suppose that the people who originally founded Mohenjo-daro were in any marked degree more primitive than its inhabitants in later days. Both bronze and copper were found in the lowest levels excavated, a fact which is not surprising, for the former metal was in common use in Sumer some five thousand years ago. But no Neolithic material has been discovered, so it is unlikely that the site was established as early as the Stone Age. The writer also considers it a mistake to term the Indus Valley civilization, as represented at Mohenjo-daro and Harappa, chalcolithic, in

spite of the fact that stone implements have been unearthed in both places. These stone implements are simple ribbon-flakes of flint which served as knives (Pl. K, 3), and specimens, together with the cores from which they were struck (Pl. K, 4), have been found in most of the houses; no doubt a knife of this type was cheaper than, and perhaps just as efficient for certain purposes as, a metal one. Another kind of stone implement discovered is rectangular in cross-section and not unlike a celt in form; it was probably a ploughshare, but these are very rare.

Mohenjo-daro, which means in Sindi "The Place of the Dead," consists of one very large mound, roughly thirteen hundred yards long from north to south, and about six hundred and seventy yards wide, with smaller mounds to the north and east. About two hundred yards away to the west rises another mound, not so large as the first, but loftier, measuring about four hundred and forty yards from north to south by three hundred and thirty yards from east to west, and having a number of hillocks on its northern, southern and north-western sides. It is uncertain whether these two large mounds were originally one, for no deep digging has as yet been done in the gap

between them; certainly they appear quite distinct to-day. The larger mound to the east appears to a casual beholder to be a complex system of low mounds, separated by ravines; these ravines actually represent the ancient thoroughfares, which have, in the course of time, become channels for the rains that normally fall in Sind in the summer months. One of these streets, running from east to west, is still used; in fact, it forms the main approach to the camp from Dokri railway station, some seven and a half miles away.

The mounds of Mohenjo-daro are of a light red tint which contrasts pleasingly with the blue of the sky and the yellow-grey of the surrounding plain. Both Harappa and Mohenjo-daro, being built almost entirely of burnt brick, have become so heavily impregnated with salt that, to this day, a shower of rain produces a mass of crystals which crumble the surfaces of newly-exposed walls. The same thing also occurs during the rare frosts that are experienced in Sind. The denudation of the mounds is slowly but surely reducing their height, while their area is correspondingly increased by the débris carried down from above. The masonry lying a foot or so beneath the surface is, of course, unaffected by

disintegration, the bricks being permanently dry or damp according to their situation. When wind, rain, or the excavator's spade removes the superficial coating of dust and exposes fresh masonry, this in turn gradually crumbles away.

The deterioration of the bricks was not by any means so rapid when Mohenjo-daro was an inhabited city, for the walls above the soil could absorb but little salt, while the buried walls of earlier times, which served as foundations, were permanently damp. This state of things was due to the fact that the plain round the city was then well watered, and consequently the destroying action of the salt was checked, although, as we know, the buildings needed frequent repair. Since that time the climate of Sind has become gradually drier, and the deposit of surface salt has increased in proportion. It is interesting to reflect that it is only the humidity of our climate which prevents the same thing from happening in England.

The date of the Indus civilization has now been fixed with some certainty, for certain objects found during the excavations now proceeding in Mesopotamia have been identified as of Indian workmanship, a point which will be

discussed in more detail later. It is enough to say here that the upper levels of Mohenjo-daro are contemporaneous with the latter part of the Early Dynastic Period of Babylonia, *c.* 2550 B.C., while the lower levels, as far as we have descended, where the objects found are barely distinguishable from those of the latest levels, could hardly antedate the latter by more than five hundred years, and perhaps as little as three hundred. This dating of the upper levels is now accepted by most authorities, but it must be remembered that it depends on Mesopotamian chronology, and that any modification of the latter must entail a corresponding re-dating of the Indus Valley finds.

Who were these people who built Mohenjo-daro and Harappa? No definite answer can be given at present to this question, though it is certain that they were a pre-Aryan race, for their cities were flourishing some thousand years before any Aryan-speaking people had entered India, an event which took place, according to modern ruling, about 1500 B.C. It may be that the Indus Valley people were invaders, as their settlements up till now have all been found in the north-west of India; but in any case it is probable that they were already highly civilized before they entered the country,

indeed, their culture appears to have been superior to that of Elam or Sumer.

Some scholars have pointed out that the pictographic script of the Indus Valley people, as shown on their seals (Pl. M), bears a close resemblance to the Proto-Elamite script, though it does not necessarily follow that the two peoples spoke the same language. Professors Barton and Speiser have put forward a theory that the later Babylonians included three races, the Proto-Elamites, the Sumerians, and the Semites or Akkadians, the first named being the earlier, and perhaps the original, inhabitants of Babylonia. A few Sumerian signs also resemble some of the Indus Valley characters, but as the Proto-Elamites preceded the Sumerians in the valley of the two rivers, it is possible that their script influenced that of the newcomers. Another interesting fact which should be noted in this connection is that certain skulls unearthed at Mohenjo-daro are of the same type as others of very early date discovered in Mesopotamia. It may therefore be assumed provisionally that the Proto-Elamites, the dwellers in the Indus Valley brick-built cities, and perhaps also the Sumerians, had a common ancestry; but beyond this it is not possible to go until further sites have

been explored in India, Baluchistan, and the highlands of Persia and more information is forthcoming with regard to the origin and lines of development of these early peoples.

Before leaving this subject, it must be mentioned that the only extant inscriptions of the Indus Valley people are the very brief ones found on the seals and other amulets. The script appears very much the same on all these objects, irrespective of whether they were unearthed at high or low levels of the two cities, which seems to indicate little intellectual advance on the part of the people after their arrival in India—a state of affairs caused, perhaps, by the influence of an enervating climate. A different and more cursive style of writing may, of course, have been used for ordinary occasions, though there is at present no evidence to prove this. The complete absence of any long documents suggests that the writing materials in general use were of leather, wood, or even, possibly, leaves, all of which have long since perished in the damp and salty soil.

Whatever the origin of the Indus Valley people may have been, it is certain that they had lived for a considerable time in India. Not only do their exceptionally well-built

cities bear witness to this fact, but fresh corroboration is also to be found in various aspects of their religion, which included tree- and animal-worship and the use of phallic symbols, features which do not appear in the contemporary civilizations to the west.

The inhabitants of Mohenjo-daro and Harappa seem to have led more or less peaceful lives, instead of continually fighting for their existence ; no evidence exists, as in Sumer, of the cities being repeatedly sacked and burnt. On the other hand, it must be remembered that a heavy toll has been taken of the bricks of both cities, and that city-walls and fortifications would be the first to be dismantled. A chain of small mounds immediately north of the stupa mound at Mohenjo-daro reveals traces of an exceptionally thick wall and what appears to be a gateway, but considerable work remains to be done here before the existence of fortifications can be conclusively established.

Mr. Hargreaves and Mr. Vats in the course of their excavations at Mohenjo-daro in 1925–6 found several groups of skeletons, one comprising fourteen in a large room and another of six in a street. All the remains, some of women and young children, lay in very contorted attitudes, and the people had evidently died a

violent death. Excavation in a different part of the city has since laid bare other groups of skeletons, one being of especial interest. In this group the remains of some members of the party lay at the foot of a staircase leading down from a street to a well, while one, a woman, had nearly climbed up to the level of the street, but had succumbed on the top step (Pl. D, b). It was thought at first that epidemic disease must have been responsible for these deaths, but this theory was refuted later by the discovery of two more groups, each containing the remains of at least one decapitated person.

It now seems certain that Mohenjo-daro was attacked by enemies during one period at least of its later history. The identity of these enemies has not yet been definitely established, but the writer is strongly inclined to the view that they came from Baluchistan, which was probably, as it was up to a hundred years ago, the home of turbulent and war-like tribes. The foothills of the Khirthar Range, which lie on the borders of Baluchistan, are only some forty miles distant from the city of Mohenjo-daro, whence they are clearly visible during the cold weather, though for the greater part of the year they are veiled in a haze of dust and heat. It is probable that these tribes only became a

danger to Mohenjo-daro in later years, when the decline of the city laid it open to attack, for the skeletons described above were, without exception, unearthed in the latest levels.

In addition to the enemies by which it was beset at a later date, Mohenjo-daro, perhaps from the time of its foundation, had a more serious foe with which to contend. This was the Indus, which now flows three and a half miles east of the city, though at one time it must have been much nearer. The river when in flood is constantly shifting its bed; it begins to rise early in June, generally being at its highest in July and August. Abnormal conditions, such as the unduly rapid melting of the snow and ice at its source, the breaking of ice dams, or excessive rains in Sind or Baluchistan, may, and often do, lead to extensive floods, which in the past could not have been anticipated. The subsidence of walls and well-linings at two distinct levels of the city, one much lower than the other, proves that a flood took place early in the history of Mohenjo-daro and that another marked the beginning of its decline. On both occasions the city was deserted for a comparatively short period, but when all danger was passed it was again occupied.

It must not be imagined, however, that Mohenjo-daro was ever flooded to any great depth. The city was, through constant rebuilding, considerably higher than the surrounding plain, so that the inhabitants were in no danger of drowning, though the water probably extended for miles, and put a stop to all commerce and trade for many months. This would be a disaster for the people, as the character of its buildings, no less than the fact that it traded with other countries, proves that their city was a thriving commercial centre. Two particularly interesting buildings should be mentioned in this connection: one is considered by the writer to have served as a large market-place, with permanent stalls arranged in long rows, and the other, at Harappa, appears to have been a gigantic storehouse.

Little is known of the political status of Mohenjo-daro, although a large, straggling building has been discovered which may have been a palace. It is quite possible, however, that this was not a royal residence, for the city, being smaller than Harappa, may have been ruled by a governor. A governor could have carried on the administration from this building besides living in it, as there is ample

accommodation for a great many people, in addition to servants' quarters and a number of storerooms. Other large and important buildings may also have been administrative centres. It is impossible to say at present whether Harappa contained a palace or not, as the buildings have been too badly wrecked by brick-robbers to supply any evidence as to the status of the city.

The apparent absence of temples in both cities is surprising, but there may, of course, have been small shrines scattered about whose ground-plans make them indistinguishable from ordinary houses. The Buddhist stupa and monastery, which stand, at a height of some sixty feet above the level of the surrounding plain, on the loftiest mound in the western portion of Mohenjo-daro, are, however, known to cover a building which may well have once been a temple. This structure has only been partially examined at present, as the trial trenches cut in the courtyard of the stupa were necessarily very restricted, and a full examination would be impossible unless the stupa were removed altogether. It is possible, however, to see that the building beneath the stupa is erected on an artificial hill about twenty feet high and composed of mud-brick, a material

which is used for the other platforms found in various parts of the site. The purpose of these platforms was obviously to raise the buildings upon them out of the reach of floods, but the height of the one which supports the structure beneath the stupa seems to suggest that it was intended to give it prominence as well as safety. When further excavations take place on this site, the axiom that once a site becomes sacred it remains so, even to the followers of other religions who may occupy it later, will probably once more prove true.

The excavation of another building by Sir John Marshall in 1925–6 seems to provide further evidence that the building upon which the stupa stands had some religious use. This second building lies a short way to the west of the first, and consists of a large bath (Pl. A), surrounded by a cloistered walk. There is also a group of eight small bathrooms at its northern end (Pl. B, a). It seems likely that ceremonial bathing was part of the religion of the people of Mohenjo-daro, as it still is among Hindus to-day, and that the large bath was the place where the people performed this ritual. The eight small rooms may have been used by the priests in charge of the building, a theory which appears to be substantiated by the presence of a

cell above each room. A full description of this place is given in a later chapter.

Mohenjo-daro and Harappa were both finally deserted at about the same time, the abandonment of the latter being due, apparently, to the shifting of the course of the River Ravi, upon the banks of which it once stood. It is not known what finally forced the inhabitants of Mohenjo-daro to leave it, although it is possible that a third great flood was the determining factor. Whatever the cause of its ultimate abandonment, the city lay in ruins until the first or second century A.D., when, as we have seen, a small part of it was temporarily occupied by a people of alien race and creed.

II

ARCHITECTURE AND MASONRY

FROM their foundation the cities of the Indus Valley appear to have been laid out in accordance with some pre-arranged scheme, whose nature is, however, easier to discern in the case of Mohenjo-daro, which is so much better preserved than Harappa. Here the streets run in straight lines, and are crossed by others at right angles, although a certain amount of inaccuracy has crept in, and there are several instances of a marked divergence from the straight; this is not altogether surprising when the date of the site is taken into consideration. In spite of these minor discrepancies it is quite clear that some definite authority must have existed to control the development of the city and to avoid tortuous alleys such as distinguish the older parts of Sukkur and Rohri, the largest living towns in the neighbourhood, and were also a feature, at a much later date, of the cities of mediæval Europe.

This task was naturally rendered easier at

both Mohenjo-daro and Harappa by the absence of awkward gradients in the flat alluvial plain upon which both were built, and though the levels of these cities were always steadily rising, this does not seem to have presented much difficulty. Where it was found necessary to raise the buildings on mud-brick platforms to keep them out of the reach of floods, the effect must have been rather uneven, but this was probably scarcely noticeable over a wide area.

It is, of course, impossible to say whether a civic body or a single official supervised the building activities, but they were evidently in very competent hands, and it is interesting to note that the Indus Valley cities are the earliest sites yet discovered where a scheme of town-planning existed. There is no evidence of such a scheme at Ur as late as 2000 B.C., though there are traces of one at Babylon at about this date, and also at the Twelfth Dynasty town of Kahun in Egypt.

Building regulations seem to have been strictly enforced in Mohenjo-daro for many years, and the greatest care was taken to prevent any structure from encroaching upon the streets. In actual practice, the latter grew wider as time went on. This was due to the fact

that, from earliest times, the walls of both houses and public buildings were constructed with a pronounced batter or slope (Pl. E, b. c), which was always preserved by the masons when any raising or rebuilding had to be done. Cases of encroachment are, therefore, extremely rare in the lower strata of the city, which, although they were not so thickly populated, must have been extremely prosperous, to judge from the excellent masonry and carefully built houses. A very different state of affairs prevails at the latest levels, for here even streets and lanes were built upon, and the original layout of the city came to be disregarded. These levels, however, mark the period of Mohenjo-daro's decline, and it is obvious that municipal law and order must then have been at a very low ebb.

The streets of Mohenjo-daro were all aligned from east to west or from north to south, for the reason that the prevailing winds always come from the two latter quarters. A north or south wind, sweeping down a broad thoroughfare, would suck the stagnant air out of the smaller streets and lanes running at right angles which in this way would be amply ventilated. It is uncertain whether the builders of the city realized that this would be the case from

the first or whether it was an entirely fortuitous arrangement; in any case it has also been observed in some of the Babylonian cities.

Some of the main streets of Mohenjo-daro are of considerable size. One long street in that city, whose course has been traced for over half a mile, travels in a straight line from north to south and divides the largest mound into two parts. It must have been a most important thoroughfare, for in places it is over thirty-three feet wide, and could easily have accommodated several lines of wheeled traffic, the cart and chariot being in those days usual methods of transport (Pl. D, a).

Another road, apparently wider than the first, crosses it at right angles at its southern limit, but as only a small part of this second street has been cleared, it is impossible to give the average width. A third road, also cutting the first, averages eighteen feet in width at the higher levels, which here are the only ones that have been excavated. The most important thoroughfare in the Stupa mound is about thirteen and a half feet wide, and runs from north to south, while the smaller streets range from nine to twelve feet in width, and the lanes and alleys from four feet upwards. Not one of these streets or lanes is paved, and the people

who used them were probably ankle-deep in dust or mud, according to the season of the year. An attempt had been made to protect the surface of one of the main roads by using a mixture of broken bricks and potsherds, which were thrown down, probably on the wet earth, and trodden in; this method cannot have been a success, as it was only tried on one occasion in a single street.

The excavated minor streets of Mohenjo-daro are much more impressive in appearance than the wider ones, as the buildings on the former are so much better preserved, a state of affairs due entirely to the rains which for centuries have poured down the wider streets and gradually reduced the height of the walls on either side. In spite of this, the walls of the principal street now stand some eighteen feet high, and will stand much higher when further digging has been done, as they obviously go still deeper into the soil. Some of the walls in the narrower streets are now over twenty-five feet high (Pl. E, c), though here also the lowest levels of the city have not yet been exposed.

The angles of some of the smaller by-ways show evidence of having been rubbed by pack-animals or the clothing of passers-by, and in

some cases the corners of a building were purposely rounded off so that loads should not become dislodged, a device which has also been observed in ancient Ur. Unless porters were largely employed, it must be assumed that the humble donkey was used in the narrow as well as in the wider streets, although its remains have not yet been discovered anywhere in the city.

Both Harappa and Mohenjo-daro were built entirely of burnt brick, except in those few places where foundations have been found composed of burnt and unburnt brick in alternate courses, or, more rarely still, of unburnt brick only. All the bricks, burnt and unburnt, are well proportioned; as a rule they are twice as long as they are wide and half as thick. They vary in size from 10·25 × 5 × 2·25 inches to 20·5 × 8·5 × 2·25 inches, but the very large bricks were intended only for special purposes—to cover drains, for example—and are not found in ordinary masonry, for which the most usual size of brick is 11 × 5·25 × 2·25 inches. Where unburnt brick was used, the sizes most favoured vary from 13·9 × 7·35 × 3·5 inches to 15 × 7·15 × 3·1 inches, all larger sizes than the common kind of burnt brick.

The bricks were shaped in an open frame-

mould of exactly the same type as that in use in India and other parts of the East to-day, and were made from the alluvial soil of the neighbourhood with no binding material. Surplus clay was removed by passing a piece of wood across the top of the mould, while the faces of the bricks were always smooth and flat, no examples of recessing or frogging being known. On the whole, they were well baked to a pleasing light red colour, the comparatively few over-fired specimens having a slightly vitrified surface of an apple-green hue. The fuel employed for firing was wood, of which there was a plentiful supply, and as no brick-kilns have been found the probability is that the bricks were stacked for firing in large heaps with flues between. The outside of the pile would then have been plastered with mud to keep in the heat.

Bricks of other shapes were made for special purposes. Wedge-shaped bricks lined the wells (Pl. B, b), though, curiously enough, this kind of brick was never used for vaulting. Only the corbel-arch was in use (Pl. C, a), in spite of the fact that the true arch was known in Mesopotamia at the same period, or even earlier. For pavements and other special purposes, ordinary bricks were often cut down to a

smaller size, such as 9·5 × 4·35 × 2 inches, and the edges and faces were then carefully rubbed smooth; in this way a bathroom pavement could be rendered practically water-tight. No patterns are ever found in these pavements, which are always severely plain, though care was taken to break the joints, and L-shaped bricks were occasionally used for corners.

In building walls, what is known as "English Bond" was usual—that is, a course of stretchers alternating with a course of headers. Here, too, care was taken to break the joints by using a half-brick where necessary. A curious method of bricklaying sometimes employed was to set some of the bricks on end, with now the flats exposed and now the sides, a practice which has also been observed on Babylonian sites. Quite long walls were built in this way, and it must have been regarded as decorative, although this type of masonry could hardly have been as strong as the ordinary style, for some of the bricks had very little to bond them in. On the other hand, these walls may have been mud-plastered, though very few traces remain to prove that this was done; only where accidental fires had occurred was plaster found on the walls, sometimes plain mud-plaster, sometimes gypsum. It is not improb-

able that all the inside walls of the houses were plastered to hide the brickwork, and they may even have been decorated with colour.

Mud-mortar, with no additional binding material, was almost universally used, and the height of some of the walls still standing proves that it served its purpose well. In special cases, such as the laying of drains, both lime- and gypsum-mortar were used, either separately or mixed with mud in varying proportions. The presence of gypsum in the interior of some of the walls is not always a proof that this mineral was extensively mixed with the mud-mortar; it is plentiful in the soil of Mohenjo-daro, and creeps into the joints of the brick-work, where it crystallizes in the form of selenite.

Owing to the non-adhesive nature of mud-mortar, it was possible for the later occupants of the cities of the Indus valley to separate the bricks of the ancient buildings and use them again, which could not have been done had pure lime or gypsum-mortar been generally used, although mud-mortar served well to prevent lateral shifting of the bricks laid in it. Quarrying for bricks appears to have been a regular custom at Mohenjo-daro and Harappa from ancient times right up to the present day. The latter city has suffered more in this respect.

Owing to its isolation, Mohenjo-daro has been more or less immune from such spoliation for many centuries, though old bricks were in great request before the abandonment of the city. Stacks of used bricks of varying sizes have been found, all ready to be taken away and used again, a practice of which there is also some evidence at Ur. The invariable use of burnt brick supports the theory discussed elsewhere that the climate of Sind was wetter in ancient times than it is to-day. In a hot climate a house of unburnt brick would certainly have been cooler; it could also have been built at much less cost.

The visitor to Mohenjo-daro is inevitably struck by the plainness of its buildings (Pl. G), which lack even the brick decoration of recessing or pilasters so often seen on the contemporary buildings of Sumer. There is, however, a possibility that the upper stories were decorated with ornamental brickwork or with carved wood verandahs and screens, which have naturally long since perished. No stone seems to have been used to relieve the monotony, for though supplies of limestone exist at Sukkur, some fifty-six miles away to the north-east, it is so full of flint that it would have been difficult to work. Large stone rings have been

unearthed which may have been threaded on poles to form columns; a description of these rings occurs later in this chapter.

Apart from shops and booths, the main streets of Mohenjo-daro must have presented a somewhat depressing appearance, for not only were windows non-existent, but, where possible, the entrances to the houses were placed in narrow by-ways. This, of course, was more often the case where the building was a large one, and it is more than likely that the owner of the house preferred to conceal his wealth behind blank walls, as is still the custom in many Eastern cities; indeed, the strategic position of certain rooms in some of the houses seems to suggest that they were provided for watchmen, a theory which is borne out by the fact that the only means of entrance is from the street. A certain amount of evidence exists to prove that Mohenjo-daro was divided for its protection into wards, and that it was carefully policed, at any rate by night, if not by day. An important city, whose buildings, no doubt, contained much valuable merchandise in addition to personal property, would always be a tempting place for the evil-doer, and theft, if no worse crime, was probably as prevalent as it is in large cities to-day.

The ground-floor of a small house averaged 27 × 30 feet, measured outside, and a large one was about double this size. There are, of course, larger houses than this, but in some cases it is difficult to say whether they were used solely for domestic purposes and even whether they were occupied by one or more families. The walls of every house, both inside and out, had to be raised from time to time (Pl. G, a), as the rubbish and ashes thrown out of doors, the mud washed down from walls and roofs, and the deposit of wind-borne dust, all combined to raise the levels of the streets. Even to-day a ground-floor room in the East gradually becomes a cellar, which in turn becomes too deep to be used, so that the walls have to be built up to provide fresh accommodation above. The same process goes on in modern cities, though here it is extremely slow, owing to our higher standards of cleanliness.

Some of the houses in Mohenjo-daro are separated from their neighbours by at least a foot of space between the walls. Party-walls may, perhaps, have led to disputes and even to litigation, with the result that it was sometimes considered less troublesome to build houses with their own four walls. The narrow space left between such separate houses was,

however, bricked up at either end, doubtless to prevent cat-burglars from scaling the walls undetected.

The thickness of most of the walls—whether of houses or public buildings—suggests that they were two or more stories in height, and in many cases the presence of square or rectangular holes indicates where the beams were laid across to form the upper floors and roof. Upon these beams, some of which were of very large size, reed-matting was spread, and this, in its turn, was covered with a thick coating of mud. In several places where it was obvious that a fire had occurred, slabs of mud from the roof, found baked hard, actually bore the impression of the matting; even the cords with which the reeds of the matting were tied together had left their impress.

The lower portion of many a staircase of burnt brick, which once led to the upper floors and roof, still survives, and is always solidly constructed with no space left underneath. In some houses no means of reaching the upper stories now exists, so it must be assumed that staircases were occasionally made of wood, which has, of course, long since perished. To economize space in what appears

to have been a very overcrowded city, the stairways have high narrow steps, sometimes fifteen inches high and but five inches wide, which the average European finds somewhat difficult to negotiate (Pl. E, d). In a few of the public buildings, however, the steps are of a more modern pattern, and in one especially important house, which evidently belonged to a person of considerable wealth, a very spacious double staircase was discovered with treads only about two and a quarter inches high and eight and a half inches wide (Pl. F, b). Occasionally a house has an outside staircase from the street, which suggests that the floors were occupied by different families, but the usual place for a stairway was in an inner court, where more room could be found for it.

The roofs of the houses must have been flat, and were probably surrounded with a parapet, a common custom in the East to-day. It is not known how these roofs were protected from the rain, but they were drained by projecting gutters made of pottery, and doubtless also of wood, which poured their contents into the street below. This method of draining the roofs is quite usual in most parts of India at the present time. As no roof tiles have been found, it is probable that

the covering used was the same as that of many of the lower floors, namely stamped clay, which needed frequent repair and the constant use of a mallet or roller to keep it in good condition. The importance of a flat roof is very great in a country where people sleep out at night during the hot weather, and in so crowded a city roof accommodation must have been doubly useful.

There is at present no evidence that the houses had windows, and light and air seem to have been admitted chiefly through the doorways. Grills of pottery and alabaster have been discovered whose use appears to have been to cover small apertures set high up in the walls, but these gratings are comparatively rare, probably because the majority of them were made of wood, which has not survived. Windows are not really necessary in a hot country, where the heat has to be shut out as we exclude the cold. Some houses appear to the visitor to have them, but these openings are really the doorways of a higher level of the city (Pl. G, a).

It is not at all likely that the absence of windows implies that the women of Mohenjo-daro were kept in strict seclusion, for, in spite of the fact that little is known of the domestic

life of the Indus Valley people, there is nothing in the planning of the houses to suggest a *harīm* or *purdah*. It is quite probable that the women had considerable social status, for the present Indian custom of carefully guarding the womenfolk is of comparatively recent date and was apparently unknown in early historic times.

Examination of the doorways of the houses does not throw much light on how the doors were fixed. Door-sockets of brick or stone cannot have been much used, as they are not often found; possibly hard wood was made to serve this purpose, or the doors may have been set in wooden frames, which would account for the fact that no trace of any attachment is to be found on the brick door-jambs and sills.

The only doorway of which the top has survived is crowned by a corbelled arch; wooden door-lintels may have been common, for wood was probably very plentiful in those days, but they would have had to be extremely thick to support the weight of the brickwork above. Only one or two doorways seem to have had bolt-holes or stops for the door.

The doors themselves were of various sizes, the width perhaps being in some cases a mul-

tiple of the height. The most usual width was three feet four inches, although doorways have been found large enough to take a door as much as seven feet ten inches wide. It seems likely that these exceptionally large doorways belonged to houses whose owners continually made use of animal transport.

It is not yet certain whether the round column was ever used at Mohenjo-daro. In large rooms one or more pillars of burnt brick have often been found that once supported a roof. Only one tapering pillar has come to light, measuring three feet square at the base and narrowing to two feet six inches at the top; all the rest are either square or rectangular in section and the same size all the way up.

Excavations at early sites in Babylonia have shown that the round column, whether of burnt or unburnt brick, was a common feature of early architecture in that country, and it is curious that it was not also used in the buildings of the inhabitants of the Indus valley, who had been trading with Sumer since as early as 3000 B.C. It would have been an easy matter to use wedge-shaped bricks for round columns for, as I have said, this type of brick was employed in the con-

struction of wells (Pl. B, b); the only explanation which seems to account for their not being so used is that the people of Mohenjo-daro and Harappa were too conservative to try any new experiments in building, though that they had the requisite skill is proved by their endeavours in other respects.

We may perhaps be disparaging them, since stone pillars may have been constructed of limestone rings threaded on wooden poles; as I have mentioned before, stone rings, varying from 16·5 to 19·1 inches in diameter and from 9·8 to 11·2 inches in height, have been found at several places in Mohenjo-daro. Rai Bahadur Daya Ram Sahni unearthed a number of them, together with two capitals, which had all been roughly piled up in a heap in a room, and whose damaged condition suggested that they had been preserved for the value of the material. Small pittings on them, which are evidently numbers, point to their belonging to two series. The presence of these numbers seems to support the theory that the rings were originally segments of two columns, which perhaps once supported the portico of a building. On the other hand, it is claimed by some, including the finder of these stone objects, that they were *yonis*

such as are commonly associated with phallic emblems.

A finer type of matting than that used in the construction of ceilings and roofs may have lined the walls and covered the floors of the better-class houses, although the poorer dwellings probably had floors of beaten earth coated with cow-dung, such as are still to be seen in most parts of India. The inhabitants of some of the houses owned very large pottery jars, which, judging from their contents when discovered, must have served as cupboards; this custom, too, is still adhered to, for very large vessels of unbaked clay are made to serve exactly the same purpose by the people of the modern villages round the city.

In some of the larger houses, however, deep recesses have been found in the walls, and these, in all probability, were once fitted with wooden shelves. Chests of wood must also have been used for storage purposes; to them probably belonged the numerous pieces of shell inlay that have been found. Fasteners of bone and shell attest the use of boxes, and we can safely say that beds and stools were also ordinary articles of furniture. Some of the latter had their legs carved in the shape

of a bull's foot, after the manner of ancient Egypt, for a stool of this type appears on a seal, but nothing very definite can be said on the subject of furniture as not a single article has survived.

Although most of the cooking was done in the courtyards—to be described later in this chapter—the houses also contained small kitchens, where the fuel was placed upon a raised platform of brick. One kitchen found in a large establishment was more elaborate in construction, for in the floor was a series of brick channels to contain fuel, over which the cooking utensils were placed. Such an arrangement is still to be seen in India, where cooking is done for a large number of people.

Pottery vessels were found sunk in the floor of some of the kitchens, and into these waste water was thrown, which gradually ran away into the earth through a small perforation in the bottom of the jar. The use of the modern "serving-hatch" seems likely to have been known in those days, since in two instances a small room, thought to be a kitchen, communicated with a larger one by means of an aperture in the wall.

Practically every house had its bathroom, which was always placed on the street side of

the building for the convenient disposal of water; in a number of cases where a latrine was also present this lay between the bath and the street wall, obviously for the same reason. The bathrooms and latrines were sometimes on the ground-floor and sometimes on the floor above, in which case the water and fæces usually ran down a brick channel in the thickness of the wall, or, more rarely, down an open channel outside it. Both these methods are to be seen in some of the towns in Sind at the present day.

The spill-way of many of these channels was stepped at varying angles, so that the water pouring down should not splash the passer-by in the street. It is quite evident that the people of Mohenjo-daro were proud of their drainage system, for the wall immediately round a drain-hole was often built of bricks so carefully rubbed down and fitted together that the joints are, even now, hardly visible. This excellent masonry sometimes projects slightly, and often provides a decorative feature in an otherwise blank wall.

The bathroom itself was usually a small square or rectangular room with a carefully-laid brick pavement sloping towards one corner. In this corner was the outlet for the

water, which, in some cases, also ran through the latrine. The walls surrounding the bath pavement were invariably wainscotted with bricks laid on edge so as to stand about three inches above the level of the floor (Pl. B, a). The slope of the pavement and the close-setting of the bricks of which it was made provided against the infiltration of water, but, as a further precaution, the pavement was sometimes laid on a thick bed of pottery débris.

Pottery pipes, each provided with a spigot so that they fitted together, were occasionally used for drainage purposes, and these have been found in both horizontal and vertical positions.

In some cases the brick floors of the bathrooms had been polished by the friction of bare feet, while in others they show a deep red deposit, which may have been caused by perspiration or by the use of oil to prevent the skin from cracking—a custom prevalent in India at the present day. Some bathrooms contained the remains of water-jars, and, to judge from the number of pottery models that have been found in the drains, it would seem that the childish habit of taking playthings into the bath has persisted for thousands

of years. Certain clay objects found from time to time are thought to be strigils with which the people of Mohenjo-daro used to rub themselves down; it is certain that they used pottery rasps to remove thickened cuticle.

Although the smaller houses were entered directly from the side streets, the larger ones were approached through a courtyard open to the sky; in one of its sheltered corners the greater part of the cooking was done. In one such place a round bread-oven was found with a small aperture at the base; there was perhaps originally a domed roof. The bread was baked by heating the oven to the required temperature with wood fuel, then raking out the ashes and clapping the cakes of dough against the hot inner side. Very similar ovens were in use in Mesopotamia at about the same date, as Dr. Woolley has shown.

Numbers of saddle-querns and curry-stones, on which grain was ground and herbs pounded, have been discovered in the courtyards of Mohenjo-daro, for the latter would be the scene of household work, cooking, sewing and other tasks whenever the weather permitted, just as in the East to-day. Animals may have been kept there as well, for feeding-bins have also been unearthed; but it is

doubtful if the larger animals were housed for the night in the courtyards, as the size of the city seems to be against it. I have already stated that the doorways are sometimes so large that it is quite possible that they were intended for pack-animals as well as pedestrians. Oxen and donkeys were doubtless used extensively for transport purposes in so large a trading community, but there is no evidence that the existence of the camel was even known to the people of the Indus valley.

It must be borne in mind, however, that the descriptions of the various rooms and buildings given above apply more closely to the earlier than to the later levels of Mohenjo-daro, for the masonry shows a marked deterioration in the period prior to the abandonment of the city. To house the ever-growing population, buildings were erected where none had ever stood before, and large houses were subdivided among several families, partly because of overcrowding, probably also because it was the custom, as it still is in the East, for the married sons to bring their wives to live at home.

In this way a house originally intended for one rich family and many servants gradually deteriorated by constant subdivision; each

room would be turned into several smaller ones, doorways would be cut through partition walls, and even the courtyard would ultimately be threatened. It is probable that the latter was not entirely given up until the family was absolutely forced to it; but it certainly became smaller and smaller, and it is difficult to be certain whether or not it was entirely covered in during the last stages of the city's decline.

Sometimes the houses would be converted into a series of flats occupied by separate families, each flat with its own staircase and sometimes, though not always, with its own drainage system.

Although the people must have lived in extremely cramped conditions in the later days of Mohenjo-daro, it is more than likely that the very poor did not live in the city at all, but dwelt outside it in daub-and-wattle huts of which, it is likely, no trace remains. It will not be possible to confirm this theory until further excavation has been done, for a considerable amount of alluvium has been deposited by the river, and the remains of such huts, if they existed at all, must be buried many feet deep. In any case, the cultivators of the fields and gardens around

the city would have lived in near-by villages, very similar to those now existing in the neighbourhood.

The method of drainage adopted by the Indus Valley people is especially well preserved at Mohenjo-daro, and is certainly the most complete ancient system as yet discovered. A brick-lined channel flowed down every street, sometimes even down small lanes (Pl. C, b), and into this main drain ran smaller tributary drains from the houses on either side. The main channels varied from about twelve inches deep and nine inches wide to roughly double this size, according to the amount of water it was calculated the drain would have to carry away. They were made of ordinary bricks cemented with mud-mortar, although in better-class work lime or gypsum, or both, was mixed with the mud in order to make it more watertight. The drains were generally covered over with loose bricks laid a few inches below the level of the soil, which could be easily lifted when it became necessary to inspect or clean the channel underneath. Exceptionally wide channels were spanned with roughly hewn limestone blocks or, more rarely, with very large bricks; the latter were, however, liable to break

under pressure, which explains why stone was evidently preferred for this purpose.

The rain-water and sewage from the various houses were usually not permitted to flow into the street drain direct, but had first to enter a sump or cess-pit in which was deposited the solid matter. When the sump was three-quarters full, the water flowed into the main drain, and by this method the street drains were prevented from overflowing. Some of the houses in the poorer part of the city evidently could not afford such costly brick cess-pits, and a large jar was used instead to receive the water; these jars sometimes had a hole in the base which allowed the contents to drain gradually away.

Very long drain channels were sometimes provided at intervals along their length with capacious brick-lined sumps. Occasionally steps were built into the walls of these sumps so that they might be entered more easily, and all of them doubtless had stout wooden covers lying a few inches below the level of the street. An advantage of this system was that blockages in channels leading into, or out of, sumps could easily be cleared by means of rods, and periodical cleaning of this kind was probably carried out by municipal officials, who seem,

on the whole, to have done their work well. Little heaps of material, mostly sand, have frequently been found lying alongside drainage channels, which shows that the débris was not always carted away when the drain was cleared.

Where one drain entered another from a higher level, a little brick-lined pit was provided at the point of entry so that the water should not escape into the soil, and where a drain had to turn at an angle it was often slightly curved in order to prevent friction. Wedge-shaped bricks were used to make these curves, and after they were laid in position their inner surfaces were carefully rubbed smooth; indeed, much more care seems to have been taken over the drains than with some of the buildings above ground.

As the level of a street rose, it was also necessary to raise the level of its drain. At first this was done without much expense by heightening the walls of the channel, but this process could not go on for any length of time, as the channel would then become too deep in proportion to its width. When the bed of a drain ultimately was too low down to be properly inspected and cleared, an entirely new channel was constructed on top of the

old one; in many cases, however, all the bricks of the old drain were removed and re-used to build the new one.

Another feature of the Indus Valley drainage system was the large brick culverts with corbelled roofs which were constructed on the outskirts of the city to carry away storm water, for much more rain fell in Sind five thousand years ago. The culverts, some as large as two and a half feet wide and between four and five feet high, had a channel of ordinary size in the floor to carry off the normal flow of water, while the larger area above only came into use at times of heavy weather. Their very fine masonry and clever workmanship make these culverts excellent examples of sanitary engineering, and they show to what a high degree of civilization their builders must have attained.

Like all systems, however, the method of drainage adopted by the people of Mohenjodaro had its limitations. In some cases it has been found that a drain was placed much too close to a well, so that a certain amount of seepage from one to the other must inevitably have taken place. Perhaps this was not so serious a matter as it sounds, especially if the well was in constant use, for the people of the

city were, no doubt, more or less immune to typhoid; but a case of cholera in the vicinity of a well would have produced very serious results.

Apart from the danger mentioned above, it is evident that Mohenjo-daro had an excellent water-supply, for brick-lined wells are a common feature, most of the larger buildings and houses having their own, to which the poorer people frequently had access. In the early days of the city it is probable that some of the wells were quite private, as there seem to be no means of reaching them from the street, but later on, as the population grew, they were thrown open to public use. The rooms in which the wells were situated were, as a rule, carefully paved, and the floor in many cases was marked with deep depressions where countless water-jars had been set down (Pl. B, b). Occasionally low brick platforms provided seats, and the sight of a knot of people gathered round a well waiting their turn to draw water and exchanging gossip meanwhile, must have been as common in Mohenjo-daro as it is in the East to-day.

The coping of the well was generally only a few inches above the pavement, and, in the case of the larger ones, it is still deeply grooved

by the friction of the ropes. As the drawer of the water usually stood straddle-legged over the well, the most convenient, and therefore the most ordinary, size was about three feet across, but wells have been found as small as two, and as large as seven feet in diameter. As the level of the city rose, the steening of the wells had to be raised from time to time, and, after the surrounding soil has been cleared away an inspection of its outer face, necessarily less carefully finished off than the inner one, provides valuable information concerning the upward growth of the city (Pl. E, a).

Owing to the fact that the silt brought down by the Indus has raised the level of its bed and of the surrounding country by about fifteen to twenty feet in the past five thousand years, it has not been possible to excavate the wells to the bottom, nor to recover the various articles which must have been accidentally dropped into them. A few have been partially cleared and put into use again, but the level of the water at the present day is very considerably higher than it was in ancient times. These wells must have been a great danger to young children, yet only two have been found with copings sufficiently high to prevent a child from falling in. In several

cases, it was found that the well had ceased to be used some time before the abandonment of the city, and in all probability this was because somebody had been drowned in it.

Before closing this chapter a short account must be given of several interesting buildings unearthed at Mohenjo-daro, of which some have been briefly referred to earlier in this book.

First must be mentioned a large structure at Harappa partly excavated by Rai Bahadur Daya Ram Sahni in 1924–5 and from then until 1928–9 by Mr. M. S. Vats, but of which no plan or detailed description has as yet appeared except in annual reports. This building, which has suffered considerably at the hands of brick-robbers, contains in its eastern portion twelve parallel walls, each about fifty-two feet long, arranged in pairs at intervals of some seventeen feet, with roughly five feet distance between each pair. The walls are in two series, a western and an eastern, divided by a broad way about twenty-three feet across.

This great building, which at present extends about one hundred and sixty-eight feet from north to south and some hundred and thirty-four from east to west, may prove even

larger when entirely excavated. The foundations of some of the walls, which are no less than nine feet thick, are composed of clay between retaining walls of burnt brick, while the walls themselves are of the latter material only. It is not yet known what purpose this building served, but it may have been a gigantic storehouse, whose design is singularly like a pictograph that frequently appears on the seals (Pl. M, 1). At all events, the details of its construction will give rise to much speculation when they are made public.

At several street corners at Mohenjo-daro, buildings have been found whose large rooms have stoutly paved floors with shallow cup-like depressions in them of wedge-shaped bricks. These, too, would probably have been taken for storehouses, were it not that their prominent positions make it much more likely that they were used as restaurants, and that the depressions in the floors held large pottery jars of liquid. This theory seems to be substantiated by one particular building where a well-made flight of steps leads down from it into the street; here a smaller room adjoining, and communicating with, a large public one was fitted up as a kitchen. In these restaurants the inhabitants of the city

probably met to combine gossip with eating and drinking, and the latest peccadilloes of the city fathers were doubtless retailed with gusto over rich food and the stronger kinds of drink.

Some distance to the south of the stupa mound is a large building which was probably a feature of the commercial life of the city. This is a spacious hall, some eighty-five feet square, with a roof supported by twenty rectangular brick piers set with great accuracy in four rows of five piers each. Owing to later building, to alterations, and denudation, the ground-plan is somewhat confused, especially on the northern and eastern sides, which are close to the slope of the mound.

The four well-paved aisles separated by the rows of columns are aligned north to south and there are unpaved strips about three and a half feet wide running between them. Raised benches must have originally stood along these strips, though all traces of them have now perished, and Sir John Marshall has compared this arrangement with the Buddhist rock-cut temples where the monks sat side by side in long rows. It is conceivable that the building was used for religious assemblies, but at the same time it is at least two thousand

years earlier than any Buddhist structure, and the writer is more inclined to the view that it was intended for a large market-hall, with lines of permanent stalls along the aisles.

To the west of the stupa, but in the same mound, is situated perhaps the most interesting building yet discovered at Mohenjo-daro. It was excavated by Sir John Marshall in the season 1925–6, and contains a large bath, built entirely of burnt brick and measuring thirty-nine feet three inches in length and twenty-three feet two inches in width (Pl. A). This bath can be entered at either end by means of a staircase with treads a little over nine inches wide and eight inches high, each tread being recessed at the ends to take a plank, which shows that the steps were originally covered with wood. Immediately below the foot of each stairway is a broad platform sixteen inches high and thirty-nine inches wide, which extends the width of the bath; this was perhaps intended for a safe bathing place for children. A paved walk, about fifteen feet across, which surrounded the top of the bath, rested on foundations composed of burnt brick cells filled with solid masses of clay, while round this promenade is a fenestrated wall whose upper portion has

been badly damaged by denudation. The openings in the wall provided access to a cloistered walk seven feet wide which continues right round the bath, save only in the north-west corner; outside this cloister there is a series of chambers of various sizes.

When the bath was emptied the water flowed through a small square hole in the south-west corner into a passage with a flat roof supported by transverse wooden beams. A vertical manhole at the western end made it possible to inspect and clear the passage. The water passed out thence through a culvert about two feet four inches wide, with a corbelled roof built high enough to allow a man of moderate height to walk through without stooping (Pl. C, a). Unfortunately the denudation of the mound prevented the final destination of this culvert from being discovered.

A large well in a room to the east of the bath is accessible from a street alongside, as well as from the inside of the building. The water from this well may have been used to fill the bath, but it could have been obtained more easily by way of the culvert, whose height would thus be explained. By closing the outfall with a sluice, the culvert could have been

refilled with clean water, which, by its own pressure, would have refilled the bath.

To avoid the risk of water-logging, the burnt brick facing of the bath was backed by a layer of bitumen, and beyond this again was a thickness of puddled clay between two brick walls. Presumably the floor as well as the walls was so treated, but it is impossible to test this point without destroying a portion of the pavement, whose excellent state of preservation deprecates any damage being done to it. Despite these ingenious precautions, a small amount of subsidence has actually occurred, though not apparently destroying the water-tightness of the bath.

North of this bath is a group of bathrooms of exceptional interest (Pl. B, a). These are eight in number, four north and four south of a passage with a drain along its centre to carry away the water. Each room is carefully paved and contains the remains of a stairway which led to an upper storey now destroyed, and another striking feature is the very narrow doorway giving on to the passage, which has jambs so thick that it would be extremely difficult for anyone to see into the room from outside; moreover, no door exactly faces another. The whole arrangement sug-

gests that it was designed for members of a priestly order, each living in a cell above his bathroom, which he entered by his private staircase. The central passage was probably used by the servant whose duty it was to supply the water. A large oval well in a room in the south-east corner of the same building was the source of supply, and the grooves cut by the ropes which drew up the buckets are still seen in the well-preserved coping.

As we have seen before, the presence of the great bath and the smaller bathrooms strongly suggests that bathing was a ritual of the people of Mohenjo-daro and that both priests and laymen had regular ablutions to perform at stated times of the day. The great bath, capacious as it is, could not have been used every day by the whole population; and since many of the houses had their own bathrooms and wells, it is far more likely that it was used only on certain ceremonial occasions, a suggestion which seems to be borne out by the close proximity of what is probably a sacred building beneath the stūpa. Alternatively, the bath may have been used for sacred fish or crocodiles, but there is no evidence to support this idea, and, indeed, the whole design of the bath and its surrounding cloister,

rooms, and corridors is against it. The two stairways, for example, would not have been needed for a crocodile-tank or sacred fish-pool, nor would it have been necessary to case the steps with wood.

In the north of the city an even larger building has to be further excavated before its nature can be established. This structure, which is about two hundred and forty-two feet in length and one hundred and twelve in width and has outer walls over five feet thick, was bounded on the south and west by two very important thoroughfares. Its interior is filled with small roughly-built rooms which are clearly no part of the original design, and it does not seem likely that the place was ever used as a temple.

A short distance south of it is what appears to be a palace—a large, straggling building of excellent masonry, arranged round two spacious courtyards, with servants' quarters, a number of storerooms and, in its earlier days, accommodation for metal-workers as well. It is about two hundred and twenty feet long and one hundred and fifteen feet wide, with walls in some places well over five feet thick; and, surrounded as it is by important streets, it seems to form an island in

an otherwise undistinguished quarter of the city.

As the alignment of its outer walls is unchanged from the surface to a depth of twenty-two feet—where the excavations at present cease—it is probable that this building was occupied for some three to five hundred years. Possibly it combined the residence of the governor with the administrative offices of the city; the fact that it kept its character for so long argues its importance. It is most unlikely that this building was a temple. It is entered from a narrow lane, as is the case with most of the houses, and has no less than three wells, two of which seem to have been entirely private.

No evidence has as yet come to light to show that the Indus Valley people used foundation deposits, although this custom was very prevalent in Babylonia and in Egypt. It is unfortunate that nothing of this kind has been discovered at Mohenjo-daro and Harappa, for where such deposits have been unearthed elsewhere they have greatly assisted the excavator to fix the date or history of a building. If only longer inscriptions than those which appear on the seals had come to light in the Indus valley,

they might have supplied welcome information.

It is true that the bricks seem to vary in size according to the level of the city, but here again the excavator is thwarted by so much old material reappearing in the upper levels; as before mentioned, stacks of bricks, obviously taken from derelict buildings, have been found in courtyards, waiting to be used again, and these bricks are of many varying sizes. The custom of burying bodies in or underneath the corners of walls, so that the spirit of the dead might protect the building, is also unknown in the Indus Valley cities, and from the little pictorial material extant it is quite impossible to say whether special ceremonies accompanied the laying of foundations, as was the case in contemporary Sumer and Egypt.

Although in the material used and in the stability and carefulness of their construction these burnt-brick cities are certainly equal to any later work found in India or elsewhere, they are far from remarkable for beauty, refinement, or decorative value. One house is so like another, with its plain, unrelieved walls, that to the modern eye something seems sadly lacking in the mental and spiritual

equipment of the builders. Except for occasional floods, there must have been little to upset the humdrum routine of these busy communities of traders, a state of affairs which doubtless brought about the atrophy of the artistic qualities of their members.

Another aspect of the building activities of the Indus Valley people has lately been revealed by Mr. Majumdar after his examination of two sites in Sind, both in the narrow corridor between the Indus and the Baluchistan border. Here on rocky ground were two large settlements, each protected by massive stone fortifications. These two sites have not yet been thoroughly examined, but it would seem that one at least was guarded by a double wall built of rough boulders; at the other settlement the wall was built of roughly dressed blocks of stone averaging 2 × 1 × 1 feet in size. This latter fort, known as Ali Murad, commands a still much-used pass in the adjacent Kirthar Range, and its presence there provides additional proof that the Indus Valley cities were menaced by the tribes of Baluchistan.

Inside these forts were numerous buildings, whose lower portions were built of stone. The upper parts of the houses are thought to

have been constructed of either sun-dried mud or mud and reeds, for there was no stone in the interiors of the rooms that might have fallen in when the upper walls collapsed.

Judging from the painted pottery found in these frontier towns and in their vicinity, they evidently date from the Indus Valley period. And from them it is clear that stone was used for building where it was readily procurable, and where, perhaps, neither suitable clay nor fuel could be obtained for making the burnt bricks that are so prominent a feature of the cities situated on the alluvium of the riverine plains.

III

RELIGION

The buildings of Mohenjo-daro and Harappa have not afforded the excavator any assistance in his search for information with regard to the religion of the people of the Indus valley, for, as before mentioned, no structure yet discovered can definitely be identified as a temple. It is quite likely, however, that a number of shrines were scattered about these two cities, although their ground-plans are now indistinguishable from those of the ordinary houses, while the building beneath the stupa, described in Chapter I, may also have been used for religious ceremonies. No documents or legends exist to throw any light on this subject, and it has therefore only been possible to gather some idea of the religious beliefs and observances of the inhabitants of Mohenjo-daro and Harappa through the somewhat unsatisfactory medium of objects which have been unearthed in these cities.

The only stone image yet discovered which

can definitely be said to be that of a deity is a white steatite head and bust, now about seven inches in height, but once much larger as the lower part of it is missing (Pl. H, 2). This figure is clothed in a robe which is carried over the left shoulder and under the right arm, and on which is carved in relief the trefoil pattern that, to judge from its frequent appearance at Mohenjo-daro and Harappa, is obviously a sacred symbol. The figure has a short beard and shaven upper lip, in the latter fashion resembling other figures, both of gods and men, found in ancient Sumer. The hair, which is practically cropped, is parted in the middle and secured by a fillet tied round the head, with two long ends hanging down behind. A hole bored on each side of the neck, just below the ear, is evidently intended to take the end of a necklace. The eyes are half closed and were formerly inlaid with narrow strips of shell, in which a cut roughly represented the partially concealed pupil. The lips are full, and the broken nose was probably of ordinary size.

The fact that this image wears a robe ornamented with a sacred device, and that provision is made for a necklace precludes the possibility that it was intended for any human being,

even a priest. The peculiar half-shut eyes have been thought by one authority to represent a state of *yogi*, or contemplation; but this may not be so, for very much the same kind of eye has been noticed in some very early clay figures from Kish and Ur.

The numerous pottery figurines from Mohenjo-daro and Harappa, however, provide the investigator with more definite information on the subject of deities. A very common figurine is that of a female, nude save for a very abbreviated skirt secured by a girdle round the loins (Pl. I, 1). These figures wear much jewellery and a curious fan-shaped head-dress with two cup-like objects, one on either side, although in some specimens this last feature is much more pronounced than in others. Several of these cups have smoke-stains inside, which suggests that oil or little pellets of incense were burned in them, in order that the goddess might hearken to the petitions of the worshipper.

These figures are almost invariably in a damaged condition, but there is strong reason to believe that they represent the great Mother Goddess, who was worshipped so widely in the Near and Middle East in ancient times, and whose cult is almost universal amongst

the lower-class people of modern India. It seems certain that these pottery images of the goddess, whose name is unknown, were kept in almost every house in the Indus Valley cities, probably in a recess or on a bracket on the wall, which would account for the fact that the figures are nearly all roughly finished at the back.

The poorer and more illiterate people probably found a deity like the Mother Goddess easier to understand and worship than any other. In India to-day she is the guardian of the house and village, presides over childbirth, and, taking a more human interest in their needs, is altogether closer to her worshippers than any of the recognized Hindu gods. It seems likely that she was so regarded by the inhabitants of the Indus valley, but whether she was considered in those days to be one of a trinity—that is, with a male counterpart and a son—or whether she was worshipped alone, as in many villages to-day, is still unknown. The association of the Mother Goddess with other deities was, however, a common feature of her cult in other countries.

Other figures of clay, which are obviously intended for male deities, wear the horns of a goat or a bull, and it would certainly seem that

both these animals were sacred (Pl. J, 1). Doubtless many others appearing on the seals and amulets were also regarded as objects of worship, each one being perhaps associated with a particular god, whose emblem it was. For some reason which it is difficult to understand, figures of male deities in pottery are distinctly rare and are entirely nude, in contrast with the female figures, which invariably wear a little clothing; necklaces and bangles may be worn, but this is by no means always the case (Pl. I, 2). Another peculiarity of these male figurines is that they are shown with long hair gathered up in a curious loop behind secured by a fillet, and with a long beard coiled inwards at the end. Where the arms remain, in figurines of either sex, they hang straight down, and are never in a position to hold anything. It is impossible to say whether the male figurines represent the consort of the Mother Goddess, as it is not yet known whether they are all intended for the same god.

Certain badly damaged statues of animals, the largest of which is ten inches high, are cut in limestone and all rest on rectangular plinths. These must undoubtedly represent gods in their animal form, and they probably come from some temple or shrine. Two

specimens are so battered that it is hard to identify the animal that was represented, but it is possible that in both cases it was a ram couchant. Strangely enough, the ram does not appear on the seals, although it is common as an amulet made in faience.

The largest and most complete figure, also couchant, has the horns and body of a ram, and a long, pendulous object in front that is evidently an elephant's trunk; this must be a fusion of two deities whose emblems were the ram and the elephant. Another of these stone statues, of which only a fragment now remains, was originally a large limestone figure of a bull. The animal's head has sockets for the insertion of the ears and horns, which were, no doubt, made of some more valuable material, and, as is the case with bulls made of pottery, there is a garland round the neck. The damaged condition of all these religious figures of animals shows that they were purposely mutilated, but who did this, or when, is not known. As the human statuary is also smashed in the same way, it seems obvious that the wrecking was done by people who regarded the worship of such figures as idolatrous or hostile to their own beliefs; and as it must have taken place long before the arrival of the

Aryan-speaking people who invaded India about 1500 B.C., it is possible that some of the hill people of Baluchistan were responsible for this damage.

The stone and pottery seal-amulets and talismans provide the largest contribution to the scanty store of knowledge it has been possible to amass on the subject of the religious beliefs of the Indus Valley people. Perhaps the most interesting scene found on any seal-amulet depicts a nude deity, with horns and three faces, seated on a stool with his heels pressed closely together in what is, evidently, a religious attitude (Pl. M, 9). Surrounding him are a number of animals—two deer, or antelopes, a rhinoceros, an elephant, a tiger, and a buffalo. The figure wears a large number of bangles on either arm, after the fashion of some of the female goddesses on the amulets, and a fan-shaped erection, very like the head-dress worn by many of the female figurines, rises from his head between horns resembling those of a bull or buffalo.

Sir John Marshall has identified this figure as the Indian god Shiva, in his aspect of Pasupati, or Lord of Beasts. The fact that the god is shown on the seal-amulet with three faces, and perhaps even a fourth on the

side turned away, gives strong support to Sir John's theory, for Shiva was, and is, pictured in India with as many as five faces. It has always been suspected that he was one of the oldest Indian gods, and that his worship dated from the prehistoric period, a supposition which is justified by this interpretation of the figure on this seal-amulet. It must not be assumed, however, that Shiva was the name of this god of the Indus Valley people, for this is merely what he is commonly called to-day. He is now said to have as many as one thousand and eight names, most of them indicating separate functions.

No less than three seals bearing a representation of this deity have been unearthed, in two cases the god being seated on a stool, and in the third on the ground. He is always nude, save for a cincture round the waist, and wears a number of bangles, but in two figures he has three faces, and in the other a single face in profile. All three representations have horns, but on two seals a sprig of flowers or leaves rising from the head between the horns strongly suggests that the figure so ornamented was a fertility or vegetation god, again analogous with Shiva, who personifies the reproductive powers of Nature.

It is still uncertain whether the female deity represented by the pottery figurines was a virgin goddess or the consort of the god on the seal-amulets. The wife of Shiva is worshipped at the present day under many names, which include Uma, Parvati, Durga and Kali, the last two typifying the goddess in her fiercest and most awful aspect, a lover of destruction and blood. There was, and still is, however, a benevolent side to her nature in some of her manifestations, and it is most probably this kindly side which is shown in the Indus Valley figurines. As before mentioned, so many ancient religions insist that a female deity must have a spouse and a son to carry on the succession that it is not impossible that the two most important deities of Mohenjo-daro and Harappa were thus related. On the other hand, as Mr. Richards has pointed out, the Mother Goddesses of Southern India are quite independent of any consort, while Dr. Hutton states that the village goddesses of that region are only at the present time being gradually provided with husbands from the orthodox Hindu pantheon. A slight indication that the Mother Goddess of the Indus Valley was a virgin is the small size of the breasts compared with those of the more matronly female figures

which are thought to have been used for votive purposes.

Another most interesting seal-amulet depicts quite a different religious subject. Here a horned goddess is shown in the midst of a *pipal*, or sacred fig-tree, before which another horned deity is kneeling and doing obeisance (Pl. M, 8). Both the goddess and her worshipper wear long plaits of hair, have their arms adorned with many bangles, and in the case of the latter, and possibly of the former as well, there is a floral or leafy spray springing from the head between the horns. Behind the worshipper a goat with a human face looks on with evident interest. A row of seven spirits, or deities, facing the opposite way to the scene above, occupies the whole of the lower register of the seal-amulet, each figure wearing a sprig on the head, a long pigtail behind, but no horns.

This scene, like many others on the seals, is somewhat difficult to interpret; the *pipal* is, however, one of the many trees regarded as sacred in most parts of India to-day, and there are several ceremonies connected with its cult. For example, on certain days Lakshmi, the goddess of wealth, is supposed to take up her abode in it, and the Hindus walk

round and round the tree, saying prayers and paying out a thread of cotton, while on other festival occasions the trunk is smeared with red lead or ochre. The leaves of the *pipal*, like those of the poplar, are agitated by the slightest breeze, and it may be for this reason that it has been looked upon from ancient times as the dwelling-place of a spirit or goddess. Women make offerings to it in the hope of giving birth to a male child, while a vessel of water is sometimes fastened to its branches for the refreshment of the souls of the dead. All these beliefs, which are undoubtedly very old, may also have been associated with the *pipal*-tree in prehistoric times. It seems certain that this tree was connected by the Indus Valley people with a particular beast, which was the urus-ox so commonly shown on the seal-amulets. A well-known seal-amulet depicts a conventionalized form of the tree, with two heads and necks of this animal projecting from its base (Pl. M, 3).

The *nim*-tree and another which resembles an acacia also occur on various amulets; and these trees, too, are still sacred in India. There must, however, have been many other sacred trees in ancient times, to judge from the numbers of different kinds held in veneration

to-day. The figures in the lower row of the *pipal*-tree seal-amulet are generally seven in number, and, as they wear similar head-dresses to the goddess above them, they must also be regarded as deities.

A most interesting clay amulet shows a large tree of uncertain species associated with a cult object at the top of which is an animal's head, with a sprig of flowers or leaves rising from between its horns. The tree has a high platform round its base very like the mud-platform often seen round a sacred tree in India to-day, and as the shrine of the village deity or deities is frequently placed on, or close to, this erection, the scene on the amulet has a modern parallel. There is some reason to believe that the sacred tree or cult figure on this amulet is guarded by a buffalo, for one appears to be tossing a man over his head, although the man may merely be vaulting over the animal, in the manner of those who took part in the sacred bull sports of ancient Crete.

Another clay amulet shows the same cult object in close association with a tree and surmounting a conical pillar, which may have been made of mud. An interesting addition to this scene is the presence of two goats, whose

front legs rest on the top of the pillar, while to the right two human figures appear to be planting something in the ground; but these are, unfortunately, far from clear owing to the condition of the object.

A third amulet of the same material shows two men each holding a tree, or part of one, while between them is a tree-deity with outstretched arms. It is difficult to say whether this scene shows a tree that has been torn asunder to release a tree-spirit, or whether two trees are being planted in honour of the deity, who may be presiding over the ceremony; the latter suggestion is more probable, as each tree or portion has separate roots. The two trees are of the same species, and the scene can hardly be that of the tree-marriage so common nowadays in India. The planting of sacred trees, however, is a custom which has prevailed in the country from time immemorial; it is looked upon as a religious rite which confers merit upon the performer. In modern times this practice is accompanied by ceremonies of the same nature as those used for the consecration of the image of a deity, and a similar ritual may have been followed in the Indus valley in ancient times. On the reverse of this same amulet a kneeling man is

seen making an offering to what appears to be a *nim*-tree.

From the evidence afforded by the amulets found in both cities there seems to be no doubt whatever that three kinds of trees, at least, were venerated, if not actually worshipped, by the people of Mohenjo-daro and Harappa. Whether this cult was confined to a certain section of the population, or whether it was universal, is at present uncertain, but as animism of this type dates from very primitive times, it may be that the former hypothesis is more correct, and that the worship of trees was confined to the uneducated.

Another feature of the religion of the Indus valley which is still practised in India is the veneration paid to phallic symbols, typified by the *linga*, or conical stone, which is now associated with the worship of Shiva. At the present day the *lingas* either have water poured over them or are anointed with butter, and are certainly the commonest religious objects in India, being found all over the country, both in villages and in the near neighbourhood of temples.

Certain large, smooth, cone-like stones unearthed at Mohenjo-daro and Harappa were undoubtedly the *lingas* of those days, but it is

impossible to say whether they were associated with the worship of Shiva at that early date. This association, however, seems more probable now that Sir John Marshall has identified one of the gods on the seal-amulets as the prototype of the Shiva of historic times and the present day.

Various small cones made of lapis-lazuli, jasper, chalcedony, and other stones, most beautifully cut and finished, and less than two inches in height, are also thought to be *lingas*, and have been compared with the objects now carried by the *Lingayat* sect in India; on the other hand, it is just as possible that they were used in the board-games described in Chapter VII. In the same way, certain large stone rings which are considered by some authorities to be *yonis*, or the female complement of the phallic emblem, may have been employed to build up columns; and until a *linga* and one of these ring-stones are found in close association, the matter cannot be definitely settled.

Overwhelming evidence of the worship of animals on the part of the people of the Indus valley is provided by the seal-amulets, which portray a varied assortment of beasts. Among these is a powerful-looking bull with one horn, although it is probable that the representations

fail to show the second horn behind the first (Pl. M, 12). Fredericks has identified this animal as the urus-bull (auroch), and he thinks that its two varieties, *Bos primigenius* and *Bos namadicus*, are plainly indicated on the seal-amulets. Other animals depicted are the elephant, the tiger, the buffalo, two kinds of oxen—one a short-horned animal and the other a humped bull—the rhinoceros, the crocodile, and a queer, composite beast with a human face, the trunk of an elephant, the horns and forequarters of a bull, and the hind-quarters and tail of a tiger, which probably represents the fusion of several deities in one animal form.

There is reason to think that most of these animals were kept in captivity, for the great majority are portrayed with a manger, or food-vessel, before them, while in front of the urus-bull there invariably appears a curious object which has not yet been satisfactorily identified, but is regarded by some authorities as an altar, and by others as a rack and crib for fodder (Pl. M, 12). It seems that this object alone must have been connected with some kind of cult, for it occurs without the animal on one object at least from Mohenjo-daro, and on several amulets from Harappa. Other animals shown

on a certain type of copper amulet of tablet form include the hare, the antelope, a horned beast, as yet unidentified, and a very unusual creature with a head at either end which, as Frankfort has shown, is not unlike certain Sumerian animal designs.

Animals are associated with the various gods of Indian mythology, each deity having his or her particular animal as a *vahana*, or vehicle. Brahma, for instance, rides on a goose, Shiva on a bull, and Durga, his wife, on a tiger; but it is impossible to say whether the animals on the Indus Valley seal-amulets were worshipped *per se*, or only because they were regarded as representing, or as an attribute of, a certain deity.

A seal-amulet found at Mohenjo-daro makes it fairly certain that the tiger was considered to be the emblem of a goddess, although the opposite seems to have been the case in later Indian mythology. On this object a goddess is seen with the horns of a goat, the usual sprig of flowers and pig-tail, but with the body, hind-legs, and tail of a tiger, the whole figure being so cleverly contrived that no undue prominence is given either to its human or to its animal aspect. We may therefore infer that in those early times the tiger-goddess

was looked upon as the consort of the deity already identified as a prehistoric form of Shiva. A tiger also appears on two seals with the horns of a bull, and as this seems to be a type of horn associated with the Shiva figures, it is possible that then, as now, the bull was regarded as the vehicle of the god.

Another seal-amulet shows a buffalo which has obviously attacked a group of people, and is standing triumphant in the midst of its victims; it is possible that this is a representation of a deity overcoming his enemies. The reader is also referred in this instance to the amulet described earlier in this chapter, where a buffalo is shown probably tossing a man over his head, with a sacred tree and cult object near by. The wild buffalo is regarded as a most dangerous animal in India as well as in Africa, and it is therefore a fitting vehicle for Yama, the Hindu god of death. As this animal is quite commonly portrayed on the seal-amulets, it must be considered, like the others, to be a symbol of a particular god, doubtless a terrible one.

The goat always occupies a secondary position on the seals, and may therefore have represented a minor deity. In more than one example it is closely connected with a tree

spirit, and when such representations are clear enough, it is seen to possess a human face (Pl. M, 8). It has always been a favourite animal in India for sacrificial purposes, for its curious habit of shivering when sprinkled with water is considered a favourable omen for sacrifice, and it may perhaps have been so used by the inhabitants of the Indus valley. In many countries the goat is connected with a god or goddess of fertility, and it is not unlikely that the goddess in the tree on the amulets of Mohenjo-daro and Harappa was connected with fertility. This animal must have been held in some importance in the Indus valley, for its horns appear on a male figurine of a deity, as well as being worn by the tiger-goddess already described.

The gharial, or fish-eating crocodile, which is quite frequently depicted on the amulets, usually with a fish between its jaws, may have been regarded as the emblem of a river-god. As this reptile is associated with the sacred animals, it is safe to assume that it, too, was considered sacred, but the deity to which it may have been attached was perhaps not regarded with special awe. The gharial, unlike the mugger (which does not appear in the art of the Indus valley), is not dangerous to

men or large beasts, in spite of the fact that it can attain to a length of twenty feet or more.

It is probable that snakes, too, were venerated, if not actually worshipped, in the Indus valley, since a snake cult has always been so popular in India. No carved figures of snakes have been found at Mohenjo-daro, however, but one has been unearthed at Harappa. The reptile also appears occasionally on the painted pottery, but the best representation of it is on a faience tablet where a seated deity, similar to those already described on the seal-amulets, is being worshipped on either side by a kneeling man, while behind each worshipper a cobra, with head raised and hood expanded, is evidently joining in the adoration of the god. A clay amulet also shows this reptile before a low stool, on which would appear to be an offering, perhaps of milk.

Two amulets made in the same mould show that the effigy of at least one of the sacred animals—namely, the urus-bull—was carried in religious processions; for on these amulets a man is seen quite clearly to be carrying the figure of this animal on a stand. Another man behind the first bears the cult object always associated with this beast, while a third carries another standard of some kind resembling a

pennon; but this is difficult to distinguish owing to the deterioration of the surface of the tablet. The writer has no doubt that the figures of the other animals carved on the seal-amulets were carried in exactly the same way; in fact, the scene on these two amulets recalls to mind the custom of bearing animals in religious processions in ancient Egypt.

Apart from those used as pictographic characters, no birds appear on the seal- or other amulets, but there is a certain amount of evidence that the dove was looked upon as sacred. Pottery models of this bird are frequently found set on little pedestals so that they stand upright, and some of these figures exactly resemble examples found at very early sites in Mesopotamia. The dove was held sacred to the Mother Goddess both in that country and in Crete, and the same belief doubtless prevailed in the Indus valley, for the method of portraying the bird, with outstretched wings and tail, is identical in all three places. A female figurine of clay, found at Mohenjo-daro, actually has two birds perched on the top of her head, which, as in the case of the figures from Crete, doubtless symbolized spiritual possession.

No evidence is as yet forthcoming whether the river Indus was venerated in prehistoric times in the same way that all the great rivers of India were, and are, regarded as holy by the Hindu in historic times and at the present day. It seems certain, however, that water entered largely into the religious observances of the Indus valley, for, in addition to the great bath of Mohenjo-daro described in Chapter II, there were bathrooms attached to nearly every house in both cities. Purification by water must have been an essential part of the ritual of the people, as indeed it still is in modern India.

A horned human figure with the feet and tail of a bull appears on one seal-amulet from Mohenjo-daro, and was perhaps a demi-god. It is depicted struggling with a horned tiger, probably representing some demon who waged constant warfare against the gods. The likeness of this man-bull to a certain Sumerian demi-god or hero is very striking, and appears to indicate that a relationship once existed between certain of the beliefs of the two civilizations. It is not impossible that these resemblances originated in a third country with which both the inhabitants of Sumer and those of the Indus valley were closely associated in the long-distant past.

Another type of hero, or demi-god, which may also have had some association with Sumer appears on three seal-amulets from Mohenjo-daro, where he is depicted struggling with two tigers. The figure, which is nude except for a very narrow band round the waist, has his face in profile surrounded by coils of hair, and is singularly like the early representations of the Sumerian Gilgamesh, the friend of Enkidu, who assisted that hero in his struggles with wild beasts. In Sumerian and very early Egyptian art, however, this figure is shown fighting lions, and it is quite probable that the Indus Valley version was adapted from one of another country, as tigers are substituted on the Indian amulets. Although the lion has now to be protected in India, it roamed over a considerable area in former days, but it always prefers open country, while the tiger inhabits the forest and dense jungle. It seems obvious that the latter animal must have dominated Sind and the Punjab in very early days, for the lion is never represented in any way in Indus Valley art, and, indeed, may have been quite unknown to the people of that culture.

An illustration frequently appearing on the amulets shows a man seated in a tree, while a

tiger below is waiting for him to descend; it is thought that this scene is taken from some legend connected with religion, as it occurs on certain amulets with other obviously religious subjects (Pl. M, 2). The figure in the tree may be a deity in human shape, for ancient creeds are full of such incidents and adventures; in any case, it was not a story known only at Mohenjo-daro, for the same scene occurs on some of the amulets from Harappa.

From the description of the animals appearing on the seal-amulets it will be seen that several beasts were often merged into one, and, indeed, seals have been found showing three different heads on one body. The heads of a short-horned bull, a urus-bull, and an antelope are all depicted uncomfortably affixed to the body of either the first or second animal, an arrangement which no doubt symbolized three deities in one. A particularly complex example of this fusion is represented by the heads of four animals—a urus-bull, a tiger, and two other kinds of bulls—and the necks of two other beasts, whose heads are missing owing to the breakage of the seal. All these are arranged like rays round a circular centre which may represent the sun. A somewhat similar conception is seen on another seal, where a six-

rayed skirl has one ray in the form of a urus-bull's head.

These skirl devices, which are certainly uncommon, are generally considered to be solar symbols. If the circular symbol on the two seal-amulets mentioned above is taken to indicate the sun, which seems likely, then the various gods who were connected in some way with it are represented by the animals' heads. In the many-headed skirl the rays are so carefully arranged round the centre that no god is elevated at the expense of another; but in the second example the urus-bull alone appears, the other five rays being blank. The emphasis placed on this six-rayed device suggests that the sun was regarded as the greatest of all the gods, and that the six animal-heads associated with it represent the premier deities of the Indus Valley pantheon.

Another aspect of the religion of the Indus valley was the practice of depositing votive-figures of animals and human beings in shrines to ensure the favourable attention of the god or goddess, a custom which still prevails in modern India. A certain type of pottery figure showing a pregnant woman, or a figure holding a child to her breast, was probably a thank-offering to a deity for the birth of a child, or

perhaps a reminder of the giver's desire for children. These votive-figures are always of the plainest description, ornaments being very seldom worn ; they are of quite a different class from the figures of the Mother Goddess. Two little models of infant boys, represented as crawling on the ground, may have been intended as special reminders that the wished-for child should be a boy, or, alternatively, may have been placed in a shrine to ensure the favour of the deity towards a sick child. Clay models of oxen were similarly used for votive purposes, perhaps to promote increase or to restore a sick animal to health, a practice which is still quite common among the poor of India.

Most of the inhabitants of the Indus valley seem to have worn amulets of some kind or other. The so-called seal (Pl. M), of which so many examples have been found, must now be regarded as having served also as an amulet, on account of the animals incised upon it. In most cases only the upper part, bearing the inscription, was employed as a seal proper, but it is not clear what material was mainly used for the sealings, as very few have been discovered. In fact, many more seals than sealings have been recovered

from Mohenjo-daro. The numerous tablets of clay and copper, in the latter material peculiar to Mohenjo-daro, are undoubtedly amulets, and the poor condition of the clay specimens suggests that they were always on the person of the owner, perhaps loose in a case. The legends depicted on them seem to be episodes in the lives of various deities, and it is quite likely that they were presented to the worshippers after visits to certain shrines. Amulets bearing the same scene are, more often than not, found in the same quarter of Mohenjo-daro, which suggests that they were obtained from a shrine in that same neighbourhood.

Apart from the clay and copper tablets, amulets of other kinds are somewhat rare. Among them are included the squirrel, the couchant ram, the hare, the antelope, and the dog, made in such diverse materials as pottery, stone, faience, or bronze, and perforated so that they might be attached to a necklace. Little figures of doves in hard stone or clay may have been worn as fertility charms, while two steatite amulets that have lately come to light are not at all unlike the *dad*, or "stability" amulet of ancient Egypt, except that the Indian specimens have a ring-like attachment at the side.

An unusual amulet of shell has a knot carved upon it; knots have always had a magical significance in the East as well as in the West. Two holes in this specimen show that it could be sewn to the clothing, and it may have served as a button as well. Intertwining linear patterns also appear on some of the amulets, and these are of much the same type as certain designs on various Sumerian seals; without beginning or end, they may have typified longevity, as such designs still do in China. Ordinary beads seem to have been valued as amulets in the Indus valley, just as they are in other countries, and certain steatite beads carved with trefoils are especially interesting, both for the careful workmanship and for the choice of the motif, which we have seen occurs on the robe of the deity already described.

Only one amulet made in human shape has come to light, and this is a small steatite figure of a deity which is a trifle over half an inch high and wears the curling horns of a ram. This is the only figure among all the horned deities which can be definitely connected with the ram, although this animal frequently appears in amulet form.

The svastika and the Greek cross (Pl. M, 5)

are quite often found on the seal-amulets, especially the former device, which sometimes occurs on a square button-seal. These symbols, however, are not peculiar to the Indus valley, for they were equally well known in Elam at a very early date, and ultimately were used in many parts of the ancient world. It is difficult to be at all certain of the exact significance of these two motifs in the religion of the Indus valley; but at the present day the svastika, which, by the way, is Eastern and not Western in origin, is regarded in India as a very lucky sign, and is commonly painted on the mud shrines of that country as well as being used in many other ways. If it be a solar sign, as some people claim, it might have been regarded as akin to the skirls which have been described. The four-armed svastika occurs at both Mohenjo-daro and Harappa with the arms pointing either backwards or forwards, and the former position appears to have been deemed quite as efficient a luck-bringer as the latter.

A device which, like several others, was evidently used as a talisman is a heart-shaped motif which most frequently appears in the form of shell inlay, and so closely resembles the ear of one of the statues that the writer is

inclined to think that they are identical. Another symbol very extensively used is derived from the intersecting circle pattern on the pottery, which shows that the latter was originally by no means a meaningless decoration, though it eventually became so.

It is still uncertain whether dancing formed part of the religion of the inhabitants of the Indus valley, although it is so important a feature of the ritual of certain sects in India to-day. A scene on a fragment of a faience amulet showing a man beating a drum and people dancing to the music seems to suggest, from its appearance on a religious symbol, that the dance was a ceremonial one; but this supposition, of course, cannot at present be verified. On an amulet from Harappa a man is playing a drum before a tiger; but here again it is impossible to say whether the tiger represents a deity in human form, or whether the whole scene is simply an illustration of "music hath charms." Another amulet from the same city shows the cult-object invariably associated with the urus-bull, while by the side of it appears a figure which may be that of a woman dancing; if this interpretation be correct, the dance must certainly be a religious one.

In connection with the subject of ritual dancing, allusion must be made to the wonderful bronze figure of a dancing-girl found by Rai Bahadur Daya Ram Sahni. The dancer, who from her features is obviously an aboriginal type, may represent the predecessor of the dancing-girls (Devadasis) who are attached to many temples in modern India. The status of these girls is considered quite an honourable one, as in many cases they are either married to the god to whose temple they belong, or are regarded as handmaidens of a goddess. It is interesting to think that this bronze figure may represent very probably a temple-dancer of Mohenjo-daro.

No cemetery of contemporary Indus Valley date has yet been discovered at either Mohenjo-daro or Harappa, and if such cemeteries exist they must be buried below many feet of alluvium. Burial customs of ancient civilizations are not only of use to the excavator in that they provide him with a multitude of interesting and well-preserved objects on which to base his theories (amulets, for example, are always found in greater profusion in a cemetery than in a city site), but they also throw much light on the beliefs of the people concerning conditions in the next world. It is extremely unfortunate

that nothing can be discovered with regard to the burial customs of the people of Mohenjo-daro and Harappa; and, for all that is known to the contrary, they may have had no belief in an after-life, though this is by no means likely.

The few human remains that have come to light in the cities are either skeletons found in contorted attitudes which have obviously not had proper burial, or so-called fractional burials, where small fragments of human bones, including in one case a skull, were immured in jars, together with a very mixed assortment of objects which may or may not have had some relation to the bones buried with them. Mr. Vats found at Harappa a number of jars containing remains of this kind, and also several earthen utensils holding skulls, which, with one exception, were buried alone. These jars, however, are different in form and decoration from the ordinary painted ware of the Indus valley, and it is quite possible that they are of later date. The writer shares the opinion with others that the Indus Valley people cremated their dead on the banks of the river and that the ashes were then thrown into the water. A less probable theory is that the remains were buried in a

powdered and friable state in jars; but the very few examples of what are claimed to be fractional burials which have come to light in a city as large as Mohenjo-daro, and which flourished for at least three hundred to five hundred years, make this most unlikely. If such burials really did take place amongst the general population, the cemeteries must be enormous, and it seems strange that no trace of them has yet been discovered, unless, as before mentioned, they lie very deep below the surface of the ground.

Owing to the sparseness of the material at present at the writer's command, the above account of the religion of the inhabitants of the Indus valley is perforce rather unsatisfactory, but it is hoped that further excavation will supply much useful information. The most important contribution to the data amassed at present is Sir John Marshall's identification of the male figure on certain seal-amulets as Shiva, or his ancient prototype; for using this theory as a basis it has been possible to assume that many of the features of modern Indian cults are derived from very primitive sources; they perhaps date back even to a period anterior to that in which the people of Mohenjo-daro and Harappa built their great brick cities.

The worship of the Mother Goddess, for example, is a very early Indian cult, and probably existed in the country long before the arrival of the Indus Valley people. This is probably true also of tree worship, which later developed into the adoration of a tree-deity, for this cult in both its forms is still world-wide to-day. Animal worship is also inherent in most primitive communities, and has existed in India and elsewhere for so long that its origin is untraceable. On the other hand, the horned human deity does not appear in the mythology of either historic or modern India, and it seems safe to say that it was introduced into that country by the Indus Valley people, and disappeared again with them. The same is true of the man-bull, who may have been a minor deity, a hero, or a demon. The horned deity and the man-bull occur in contemporary Sumerian mythology also, probably because the two civilizations derived these cults from some parent source.

If the view be correct that the Indus Valley people entered India from the north-west, they must have found that country already inhabited by a people who were in a fair state of civilization, and who were making quite good pottery on the wheel and decorating it in

two or more colours. What the beliefs of these earlier people were is at present very uncertain, because only tentative examination has been made of their settlements, nor is there any skeletal material to enable their race to be determined. From the very little we know about them it would certainly seem that they were not of such an advanced culture as the people whom we now term the Indus Valley people; but it is quite conceivable that the Indus people borrowed certain elements of their religion from this lower culture—elements which have persisted down to the present time. The educated Brahmin priest of to-day has to fight against the very primitive beliefs and cults practised by many of his flock, and frequently all he can do is to attempt to reconcile these cults with those that his Aryan-speaking forbears brought in. I have no doubt that the Indus Valley priesthood met with exactly the same difficulty and had to acquiesce in much with which they had little sympathy. There surely was a better-educated section of the population of Mohenjo-daro and Harappa and their sister cities who professed a more abstract religion; and if that was the case, this chapter is perforce very one-sided, for nothing has survived which provides the slightest clue to

what this aspect of the religion of the time may have been. It is to liturgies that we have to turn for information of this sort; but unfortunately all such documents, being written on perishable material, have long since disappeared. Even if such documents were to come to light in the course of further excavations, it would probably be a very long time before they could be interpreted.

IV

DRESS AND PERSONAL ORNAMENTS

If, as seems likely, it is permissible to take the costume worn by the clay figurines of the Mother Goddess as representative of the normal attire of the feminine population of Mohenjo-daro and Harappa, then there is little to describe, for, with the exception of much jewellery, these figures are bare to the waist, and otherwise wear only a very scanty skirt which terminates well above the knee (Pl. I, 1). As much the same costume is worn by many of the women of Southern India, the view may be provisionally accepted that the dress of the figurines was the usual attire of the Indus Valley people, especially as there is strong reason to believe that the climate of North-west India has altered considerably since the middle of the third millennium B.C. A very similar skirt is worn by the female deities on the seal-amulets, though it appears to be considerably shorter in front than behind (Pl. M, 8).

The skirt of the female figurines is represented as held by a girdle, that seems in some cases to be strings of beads (Pl. L) and in others would appear to be bands of woven material secured in front by a brooch or fastening of some kind. A badly mutilated female figure of unusual size wears a girdle fastened in front by a very elaborate bow of some woven stuff, and on other figures the skirt is ornamented with a series of large bosses of unknown material. One figure at least wears a cloak wrapped about the upper part of the body. This cloak, which conceals the arms but shows the breasts, does not extend below the hem of the skirt, and was probably worn as extra protection in the cool of the day.

The exact material which composed the fan-shaped head-dresses so often worn by the female figurines, and sometimes even by the male, is not known, though it may have been a stiffened cotton cloth supported by a framework. Neither is it possible to say what material formed the curious pannier-like erections present in many instances on each side of the head; but the fact that these were sometimes supported from the top of the head seems to show that they must have been heavy (Pl. I, 1). The cumbersome nature of this head-gear

may seem surprising; but even to-day the women of certain Mongolian tribes wear a head-dress not at all unlike that of the figurines, while equally complex ones are worn by women of other countries.

A very curious, very tight collar which gives an appearance of greater length to the neck is worn by a few of the figurines. It is difficult to say definitely in every case of what this ornament could have been composed, but in one instance it seems to consist of a number of metal rings fastened together by vertical supports. This custom of wearing stiff neck ornaments still exists in some parts of Africa and in Eastern India.

Of the total number of female figurines discovered, only one shows any malformation, and only two are nude. The former, which is made of clay, is unusually well finished, but the waist appears to have been unnecessarily constricted. This figure is headless and wears the usual short skirt, necklace, and other jewellery, including many bangles on the fore and upper arms. There is no reason to doubt that this figurine represents the Mother Goddess.

The nude figures are of bronze, and represent dancing-girls. It is quite possible that, as in

ancient Egypt, followers of this profession appeared without clothing in certain dances.

It is difficult to deduce anything of the costume worn by men from the male figurines or from the heroes and deities portrayed on the seal-amulets; the former are invariably nude (Pl. I, 2), while the latter wear only a thin band round the loins. From the few statues which have been found, none of which is perfect, it seems that a robe, with or without embroidery, was worn over the left shoulder and under the right arm (Pl. H, 2). One statue wears such a garment extending well below the knees, and another, that of a seated figure, is dressed in a long skirt secured round the waist by a running cord. The figure of a man on a sherd found at Harappa might be wearing breeches or, alternatively, a close-clinging *dhoti*. No footwear is shown on any of the figures discovered, nor has any survived.

Before leaving the subject of dress it should be mentioned that, though there is proof that cotton fabrics were used at Mohenjo-daro, there is at present no evidence of the use of linen or wool. The existence of linen cloth in Elam at about the same date seems to indicate that it was also known at Mohenjo-daro, and,

if not actually manufactured in the Indus valley or elsewhere in India, it may well have been imported, like so many other things, from Elam or Sumer. It is uncertain whether wool was used, though sheep and goats could have provided an ample supply of raw material. Possibly there were also other fibres, such as different kinds of basts, suitable for woven cloth; but the writer has no doubt that, considering their very advanced state of civilization, the people of the Indus valley must have been quite as well provided with various stuffs suitable for clothing and ornamental purposes as any of their contemporaries in other countries.

With regard to methods of doing the hair, more is known of the styles favoured by the men than of those in vogue among the women, for the head-dresses worn by the female figurines prevent the hair from being seen. A piece of statuary exists, however, in which a woman's curly hair hangs down in a mass at the back of the head, and a badly damaged head of a small steatite figure has exactly the same arrangement. The figures of goddesses on the amulets sometimes have a plait tied with a bow at the end, and as this is a favourite way of dressing the hair in modern India, it is

unlikely that plaits were reserved exclusively for divinities.

Men had varied styles of hair-dressing. The steatite statue of a deity wears his hair parted in the middle, and the short locks at the back of the head are kept tidy by a woven fillet (Pl. H, 2). Other statues show it closely gathered up in a bun, after the fashion of ancient Sumer, certain folds in the bun suggesting that the hair was first plaited (Pl. H, 1 b). Several clay figures have the hair coiled in a ring on the top of the head and in similar rings concealing the ears; the latter arrangement is also found in Sumerian statuary. Yet another fashion is a plaited lock carried outwards from the back of the head in a large loop which turned in again and was secured by a fillet. A clay figure of a crawling infant with curly hair has been found at Mohenjo-daro, and it is quite probable that some of the people, at any rate, had curly or wavy hair.

Methods of trimming the beard were almost as varied. A short beard with a shaven upper lip is shown on two figures (Pl. H), and a stiff, flat beard projecting outwards on others (Pl. I, 2). Another clay figurine has the end of the beard coiled inwards, in direct contrast to the false beards worn in ancient Egypt; and

in yet another case the beard consists merely of a slight tuft left beneath the chin, the rest of the face being shaved. Most of, if not all, the male figurines, however, represent deities, but the evidence afforded by the statues goes to show that the ordinary man always wore a short beard, sometimes even a cropped one. Beards were never as long as they were in Sumer; possibly because long, full beards were not desirable in the more humid climate of India.

A description of the jewellery worn by the people of the Indus Civilization naturally follows an account of their dress and general appearance, and it should be explained that our knowledge of their ornaments is derived chiefly from the various hoards which have been unearthed at Mohenjo-daro and Harappa. This jewellery had been placed for safety in vessels of silver, copper, and bronze, and in most cases was found buried beneath the pavements of the houses. Perhaps the most interesting discovery was made by Rai Bahadur Daya Ram Sahni, who unearthed at Mohenjo-daro a number of necklaces and fine hard stone beads, some of which were contained in a silver jar and others lying loose in the soil. It was possible to see, moreover, that this jar had

once been wrapped up in a cotton cloth, for the patina that formed on it had preserved some of the material. Mr. Dikshit also unearthed at Mohenjo-daro a small silver vase containing some very fine necklaces, various silver and gold objects, including fillets, and fragments of scrap metal. At another place a very elaborate girdle was found in a large copper bowl, on top of which a copper dish had been placed to serve as a cover (Pl. L). At Harappa, Mr. Vats made a notable find of ornaments, some resembling the jewellery of Mohenjo-daro, and others quite unlike it in design. This last hoard was discovered in a bed of hard earth.

The metal ornaments of the Indus Valley people were made of gold, electrum, silver, copper, and bronze. Both the gold and silver were probably found in India, and though silver is now scarce in that country, much of the ancient supplies of this metal could have been obtained from argentiferous lead brought from Afghanistan. Electrum, a mixture of silver with gold, exists in several places in India, but it is unlikely that the silver content was ever extracted in ancient times, as this process, unlike that of extracting silver from lead, would have been extremely difficult without modern appliances. Silver, however, cannot

be classed as a rare metal, though it was not so common at Mohenjo-daro as gold, copper, or bronze.

The fine girdle mentioned above deserves a detailed description. It consists of six rows of barrel-cylinder, translucent, red carnelian beads, each bead being about five inches long and separated from the one following by spherical bronze beads and a bronze spacer pierced with six holes for the strings. The girdle, which is about three feet four inches long, has at each end a flattened hemispherical terminal of bronze, originally gilded, and through these terminals the strings were carried and fastened (Pl. L.). Some of the female figurines wear girdles of this type, the beads and spacers being represented by strips of clay. The holes in the carnelian beads are as well polished as the outer surface, and it must have required great skill to bore such hard stones. Each bead had been drilled from both ends, in many cases with such accuracy that the holes meet exactly in the centre. It is difficult to say what apparatus was used for this boring, but the drill was probably of copper, and a very fine emery must have been used as an abrasive. The care taken to polish the interior of each bead so that no white marks should mar the

semi-transparent stone marks a very high stage of craftsmanship.

A necklace of peculiar beauty consists of a single row of barrel-shaped, translucent, green jadeite beads, each separated from the next by a disc-shaped bead of gold formed of two slightly domed pieces of metal soldered together round the edge. Seven pendants of agate and jasper hang from the centre of this exceptional necklace, and the whole effect is very fine. The jadeite probably came from North Burma, but supplies of it are also said to exist in Tibet.

Other necklaces are made of minute, gold, cylindrical and globular beads interspaced with small beads of steatite, some of which still show their original blue glazing. Another interesting example is made up of gold disc beads, each bead consisting of two round plates of gold which had been grooved to form a channel for the cord before being soldered together. Exactly similar beads are known to have existed in Babylonia, Egypt, and Troy.

A very fine bracelet from Mohenjo-daro consists of six strings of globular gold beads separated at intervals by flat gold spacers, and it has a hemispherical terminal of gold at each end. Its simplicity and accuracy of con-

struction make this bracelet an admirable piece of work; it seems to have been a favourite pattern, for several specimens like it have been found at Harappa.

Another very striking ornament (Pl. J, 3) is a pectoral of light yellow steatite, measuring 2·7 inches in length and 2·5 inches in width. This probably had some religious use, for carved upon it in relief is the ear-shaped symbol, together with the figure of an animal resembling the urus-bull, which so frequently appears on the seal-amulets. The recessed edge of this pectoral suggests that it was originally cased in metal, probably gold, to which rings were attached to suspend it. Parts of the animal and the motif above it were recessed for the accommodation of a coloured paste.

Carnelian, jadeite, and steatite beads have already been mentioned in describing the girdle and necklaces, but beads have also been discovered in a variety of other materials. These include riband-jasper, red, yellow, and blue jasper, agate, moss-agate, onyx, amazonstone, heliotrope, plasma, lapis-lazuli, tachylite, chalcedony, nepheline-sodalite, shell, pottery, faience, vitreous paste, quartz, breccia, serpentine, turquoise (very rare), and hæmatite (very rare); all the stones in this list, with the

exception of turquoise, could have been obtained in various parts of India, Afghanistan, and Baluchistan.

When the nature of the stone permitted, the bead was first flaked longitudinally into shape and subsequently rubbed smooth with an abrasive. The final shaping may have been done on some instrument as a lathe, but, though it might be supposed that the presence of the hole would have facilitated this process, the actual boring was, as a matter of fact, done last of all. Unfinished beads of later date found in other parts of India also show that the boring was left until the end.

By cementing two or more different stones together, beads were sometimes made up to simulate well-marked, or perhaps more valuable specimens. A barrel-shaped bead of this nature, although only 0·49 inch long, was made up of no less than five alternate segments of red carnelian and white or blue chalcedony; it was so carefully constructed that its compound character might never have been detected if it had not fallen to pieces in the copper canister in which it was found. Another bead, made to imitate an onyx, had two faces, one of shell and the other of pink limestone. This was not so successful a piece of work, if it

be assumed that such compound beads were designed to deceive buyers who regarded regularly veined stones as being more precious than if irregularly veined.

What was probably considered a bead of special value was constructed of carnelian, with a pattern painted upon it in white which was subsequently fired (Pl. K, 5). This is technically known as "etched carnelian," and is not common at either Mohenjo-daro or Harappa, although several specimens have been discovered at the former site of the same shape and with the same painted pattern as beads found by Dr. Woolley in the Royal Tombs at Ur. It is not known whether these beads were made in India, Sumer, or a third country, but their presence at Mohenjo-daro is important as a means of dating that city. Etched carnelian beads were sometimes copied in a soft stone, such as steatite, by painting lines of burnished red on a smooth red ground; but as the finished product had not the translucency of the real stone, it doubtless deceived but few.

A number of beads of beautiful workmanship were found loose in the ground among one of the hoards of jewellery. These beads are in a variety of materials and, though not unusual

in shape, are in polish and regularity quite equal to anything that has been found at any ancient site. Great care had been taken when cutting them to get their natural veinings in as regular a position as possible, a task which calls for considerable skill on the part of the lapidary. To enhance the beauty of some of these variegated stones, especially of those with natural veinings, they were sometimes capped at each end with gold, a custom which also prevailed in Sumer.

Several statues unearthed at Mohenjo-daro show, as we have seen, that, as in Sumer, fillets or head-bands were worn round the forehead (Pl. H). Quite a number of these have been found with the other jewellery, coiled into rolls to save space, and in many cases still retaining their flexibility. These fillets are usually thin ribbons of gold, a little under half an inch in width, and sometimes as much as sixteen inches long. The ends are rounded and pierced with a small hole to enable them to be tied together. As a rule, the fillets are severely plain, but specimens are known with holes bored along one edge to enable ornaments to be suspended from them, and in one case a device was indented at both ends of the band. Fillets ornamented in a similar way, either

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with a row of dots or with figures of animals, are well known in early times in Sumer.

Small metal cones are worn to-day on the top of the head by women in the Punjab, and ornaments of this kind have been found among the hoards of jewellery unearthed at Mohenjo-daro and Harappa. These cones, which average 2·45 inches in height and two inches in diameter, are of gold, silver, copper, and faience, and have a loop soldered inside the tip, through which a lock of hair must have been passed to keep the ornament in place. Certain hollow hemispherical or cone-shaped objects, made of two, three, or even four pieces of shell carefully fitted together, seem to have served the same purpose. Several of the female figurines wear similar head ornaments.

The presence of earrings on some of the figurines shows that they were sometimes worn, but actual specimens are very rare, owing, perhaps, to the fact that a ring which pierces the ear-lobe is of all ornaments the most difficult to lose. In addition, the rings themselves are sometimes hard to distinguish from finger-rings, for they often consist of simple coils of gold, silver, or copper wire. One more elaborate pair, however, is composed of

studs of gold, each 1·2 inches in diameter and having a slightly domed face with a cable pattern round the edge. Soldered inside each stud is a short tube designed to pass through the ear and fit into a smaller stud at the back of the lobe.

Nose ornaments are very common, and are usually blue faience or a blue vitreous paste with a projecting, headed stud to hold them in position in the bored wing of the nostril. As a rule, these nose-plugs are ornamented with a device derived from the intersecting circle design (Pl. O, 4), and they were probably valued also as amulets. Ornaments of a very similar shape are much worn in many parts of India to-day.

Finger-rings are plentiful, some simple bands of rounded or flat wire, others consisting of coils, sometimes as many as seven in number. All the rings of this type are of copper or bronze, for no gold rings have been found, and the only silver one discovered is of unusual design. This ring consists of a flat, square bezel, incised with a multiple cross pattern and attached to a flat silver band to go round the finger.

Bangles and bracelets were commonly worn, for statues of ordinary mortals as well as of

deities have both arms ornamented in this way. The materials used were gold, silver, copper, bronze, faience, shell, and even pottery. The gold and silver specimens are penannular in shape and have hollow interiors filled in with either a fibrous or a lac core. Those of copper and bronze are rounded wire slightly flattened on the inside, with the ends sometimes touching or overlapping, while the shell bracelets are usually in the form of broad bands joined together in two or three pieces with cords, or else segments from the walls of very large shells. Faience bracelets are rare, but the specimens range in width from simple rings to wide bands. Pottery would seem a curious material for bracelets, but such ornaments have been found and appear to have been made in a mould and burnt to an excessive hardness. The writer is inclined to think that these bracelets were either made of sacred clay, or intended for a class of people which were not allowed metal ornaments. These pottery bangles are not beautiful, but they are extremely well made, and, in the case of the better preserved ones, are carefully inscribed with one or two minute pictographs, a fact which seems to indicate that they were valued by their owners. With the exception

of those made of faience, which are sometimes fluted, or incised with a chevron pattern, these bracelets, save the gold one already referred to, are severely plain.

Anklets are difficult to distinguish from bracelets, but their presence on some of the clay figurines proves that they also were worn. The foot of a little bronze statue has an anklet of much the same pattern as that worn by the hill-women round Simla to-day, and, what is still more interesting, this same type of curved anklet appears on a figure in a fresco at Knossos in Crete.

The statues, as we have seen, prove that long hair was worn by men and women alike, often gathered up in a knot, or bun, at the back of the head and partly secured from falling by a fillet which passed round the forehead. One of the male heads distinctly shows, in addition, a hair-pin in the bun; and the fact that numerous hair-pins of various makes have been found indicates that they were popular. What must have been a very fine specimen, of bronze, 4·4 inches long, is surmounted by two heads of black buck placed back to back, each head having the characteristic spiral horns. Another bronze pin has a coiled head, and in this respect resembles pins found in Sumer, Egypt, the

Caucasus, and Central Europe, while other perfect, or nearly perfect, pins are of ivory or bone, sparsely ornamented. Various pin-heads have been unearthed whose stems appear to have been made of wood which has perished. One such head, a little over half an inch high, represents a charming group of three monkeys in a ring with their arms round each other's shoulders; and another very similar group, in the same soft steatite, shows two monkeys huddled together as if for warmth. Other pin-heads of glaze represent the seed-vessels of the lotus, while numerous examples occur of pin-heads decorated with various ornamental patterns.

Combs were sometimes worn in the hair, a custom which still prevails among Indians of both sexes. A fine, double-toothed comb of ivory, decorated on both faces with a series of incised, concentric circles, was found close by the skull of a young girl (Pl. K, 1), and another comb V-shaped in design seems to have been made for combing long hair, although its exceptionally fine and closely set teeth would imply that it also had other uses.

Round buttons of copper, bronze, steatite, or faience are common, but it is uncertain whether they were merely decorative or utili-

tarian. The most usual variety resembles ancient buttons found in Malta, Portugal, Southern France, and many other countries, and has a plain face with two converging holes in the back for the thread. The metal specimens are frequently dome-shaped, with two holes at the top to sew them to the garment; and certain small hemispherical buttons either have slight cavities at the base bridged across with a strip, or they are hollow with loops inside like the cone-shaped head-ornaments.

Three mirrors, one of small size for a child, are of bronze and severely plain in style, though the wooden handles, which have not survived, may have been ornamented; a raised edge round one face of these mirrors served to protect the polished face from scratches (Pl. N, 3). Mirrors were probably quite common, for without them the various cosmetics discovered could not have been satisfactorily applied.

Kohl-pots and sticks prove that the women, and perhaps the men, used this, or some similar black substance, for the eyes; and an interesting find of rouge contained in cockle-shells provides a link with contemporary Sumer, for the same type of shell, used to hold face-paints, has been taken from graves at Kish

and Ur. Carbonate of lead has also been discovered at Mohenjo-daro and Harappa, where it was possibly employed to whiten the face, a practice known in ancient Greece and also in China. On the other hand, it may have served as an eye-ointment or a hair-wash. Cinnabar, too, was used at Mohenjo-daro, probably as a cosmetic; and the finding of lumps of a green substance, identified as *terre verte*, tempt the writer to believe that this material was, like kohl, used for the eyes, as was malachite in ancient Egypt. As this substance, however, forms the green colouring on some of the polychrome pottery, it may well have been employed solely for that purpose.

Both sexes seem to have used minute razors for depilatory purposes, as these have been found in large numbers.

V

COPPER AND BRONZE: IMPLEMENTS AND TOOLS

THERE was evidently no scarcity of copper and bronze in the Indus valley round about 2800 B.C., for the latter has been found even at the lowest levels of Mohenjo-daro, where one specimen contained as much as 22·2 per cent. of tin. Dr. Frankfort and Dr. Woolley have also noticed that tin was very much used as an alloy to toughen copper in Sumer at a period contemporary with the Indus civilization.

It is difficult to say where the metal-workers of the Indus valley obtained their tin, for although it is to be found in several places in India, such as Burma, the Bombay Presidency, Bihar, and Orissa, it is uncertain what sources were available in ancient times. It is a moot point whether the tin used by the early Sumerians and the Indus Valley people came from the same place, but the writer considers that this, in all probability, is not the case.

With regard to the copper used by the ancient inhabitants of the Indus valley, supplies of this metal may have come from Rajputana or Baluchistan. Dr. Desch has shown, however, that the copper and bronze of the Indus valley, like that of the Sumerians, contains an appreciable amount of nickel, and as Mr. Peake has suggested that a possible source of the Sumerian copper was Oman, where old workings have been found in which the ore is of this type, it has been suggested that this district of Arabia also supplied the Indian cities. The presence of nickel has, however, also been detected in the copper from the old, but still worked, mines of Chota Nagpur in India, and it is perhaps safer to assume for the present that the copper used at Mohenjo-daro and Harappa did not come from abroad.

The use of tin to alloy copper has the effect of hardening the latter and also facilitates casting, but too much tin makes a brittle product. As a rule 9 to 12 per cent. of tin suffices for ordinary purposes, but in some of the bronze from Mohenjo-daro over 26 per cent. has been found. It would seem that the metal workers of the city, like the early Sumerians, either used no fixed proportion of tin to copper

or obtained their bronze ready mixed from sources over which they had no control.

The finding of a considerable amount of copper ore in a brick-lined pit at Mohenjo-daro proves that this metal was smelted there, although no furnaces have been discovered in which it could have been reduced. A very simple method would have been to heat the ore mixed with charcoal in a hole in the ground by means of a blast. The shape of several copper ingots from the city, one of which weighs two and a half pounds, suggests that this was done, and that the metal when molten ran through a channel into an even, semi-circular depression in the ground; a projection on one side of some of these ingots shows how the moulds were filled. The flat upper surfaces of all the ingots are very puckered owing to unequal cooling.

No trace has been found of soldering in the case of copper or bronze work, although this process was employed on gold and silver. Rivets were generally used to join the two first-named metals, but in one instance a handle was fastened to a bronze cover with a rivet, which was then made more secure by running a little molten metal over it.

With the exception of three very plain silver

vessels, all the metal utensils yet discovered are made of copper or bronze, the majority of these being extremely simple in shape and in many cases following the forms of the pottery. They were either beaten out of sheet metal or were cast. It was not the custom to engrave these metal vessels in any way, and the only case of fluting occurs on a censer whose edge is also ornamented with indentations. Some of the jars with very narrow bases had the latter made separately and then lapped on, but in no case does an edge appear to have been turned over to stiffen the rim. With the exception of certain frying-pans no metal utensil has yet been found with a handle or spout.

Blade-axes of very simple form appear to have been used for a number of purposes, and of these there are two kinds, the long and narrow (Pl. N, 2), and the short and broad. The longer ones probably served as adzes, and were supported by the handle more or less their entire length, while the shorter specimens are thought to have been set at right angles to a handle cleft to take the blade. Both types, whether of copper or bronze, have double-sloped, lunate edges, slightly sloping sides, and square-cut butts, and were cast in moulds and finished

off with the aid of the hammer and an abrasive.

Several defective castings that have been found show that the blades fresh from the mould were of the same shape as the finished articles, except for their rough surfaces, so that the metal must have been tempered and consolidated mainly with a hammer; even a bronze blade with a small amount of tin could be so hardened in this way that it equalled mild steel. Some of the blade-axes are of considerable size, and one, eleven inches in length, weighs four pounds three ounces. It cannot be assumed that these were used in war, as there is no evidence that their inhabitants were ever seriously threatened by outside enemies until the last phases of the existence of the Indus cities; but they could have been used in working wood, in the chase, and perhaps against dacoits, like the little battle-axe so often carried by the countryman of Upper Sind.

One very fine bronze axe-adze, about ten inches long, has a hole in the head to take a handle, and is the first socketed implement to be found at Mohenjo-daro (Pl. N, 1). This axe-adze is very similar to some discovered in the basin of the Kuban river in the Caucasus,

while its tubular collar resembles that of specimens from Tepe Hissar in North-east Persia. As it is at present the only one of its kind unearthed in the Indus valley, its date cannot be fixed until other examples are found. Socketed implements were, however, quite common in Sumer at a time contemporary with the Indus cities, although nothing has yet been found there of the same date that is strictly comparable with the specimen from Mohenjo-daro. A model axe with handle, in clay, which has been lately found in the city has the head coloured to imitate metal, and is quite unlike anything that has been discovered elsewhere. This, too, has a socketed head, and is a further proof that this type of weapon was known to the native metal-workers.

One of the most interesting tools yet unearthed is a bronze saw, sixteen and a half inches long, which once had a broad wooden handle; three rivet-holes indicate where it was attached to the blade. The astonishing thing about this saw is that the toothed edge is undulated in order to prevent its binding in a cut, in contrast to the modern method of setting each tooth separately to achieve the same end. Saws with the teeth set in any way whatever have hitherto been unknown before the time

of the Romans, and it is extremely interesting to find so much earlier a specimen, and one, moreover, in such a good state of preservation.

Two copper swords, or dirks, the larger of which is eighteen and a half inches long without the missing handle, were among the most welcome finds at Mohenjo-daro. Both are considerably thickened down the middle for strength and are in excellent condition, but, to judge from their blunt points, they would have been more useful in slashing than in thrusting. Swords of so early a date are extremely rare at any site; at present the only specimen to be compared with them is one lately discovered at Tell el-Ajjul in Palestine by Sir Flinders Petrie, and assigned by him to the period of the Old Kingdom of Egypt, a period which is approximately that of Mohenjo-daro.

The spear-blades used in the Indus cities are an unusual type, the largest, of very thin bronze, being over fifteen inches long and nearly five inches broad. A blade of this description must have been very liable to buckle, and to prevent this a mid-rib of wood, probably made in one with the shaft, was attached to the blade by thongs or wire passed through the metal. Even with this stiffening the edges of such a

blade must frequently have been bent out of shape, and it is still a matter for conjecture why the Indus Valley people were so economical in the metal for their spear-blades when both copper and bronze were so lavishly expended on the manufacture of other tools and implements. Certain small, broad blades have also been discovered which are thought to be lance-heads.

Daggers are sometimes difficult to distinguish from knives, and in some respects closely resemble the simpler forms of the latter. They are long and leaf-like in shape, occasionally with a rough mid-rib, but more often flat; they have an immature tang either with, or without, rivet-holes. Quite a number of the knives are of curious shapes, a very common type having only one edge and an upturned point; but this may have been made to serve a special purpose, perhaps leather-work. A broad, leaf-shaped blade with two edges was also very popular. Most of the blades appear to have been cut out of sheet metal, and many have been sharpened so often that the edges are pronouncedly concave. A portion of the original wooden handle of one knife, which is in a fair state of preservation, was made of a wood (*Dalbergia sisu*) that is commonly used

at the present day for the handles of tools. Mention has already been made of the flint knives so much used by the Indus Valley people and of which so many specimens have been found.

Arrow-heads fashioned from thin sheet metal with pointed wing-like barbs are very common, but no stone arrow-head has yet been found at Mohenjo-daro. The arrow-heads seem to have been strengthened in the same way as the spear-heads—that is, by the addition of a wooden mid-rib—but owing to the smaller surface they were cemented rather than tied in.

The proximity of a river famous for its fine fish explains the number of fish-hooks found at Mohenjo-daro. These were made of bronze and have a single barb, and an eye at the end of the shank secured them to the line. Only in one or two cases is the point of a hook off-set, but this may be accidental. Several hooks were discovered with cotton thread or cord wound round their shanks, and may quite likely have been the property of small boys.

No less than four types of razor were used by the Indus Valley people. The most popular has opposite blades of dissimilar shape at the end of a long rod-like handle. Another kind is L-shaped, and a third has a handle

which bends backwards parallel with the blade and terminates in a duck's head. The fourth type, which is very rare, consists of a long, thin, straight blade with a rounded edge at one end. Possibly some of these razors were used for removing hair from the body as well as from the face, and, to judge from the numbers unearthed, it appears that they were used by both sexes.

Chisels are very plentiful, all of them having double-sloped edges and made from round or rectangular rods of copper and bronze. Some of them resemble specimens found at other ancient sites, but one variety with a flat, substantial tang is peculiar to the Indus valley.

In one hoard of copper found at an early level at Mohenjo-daro, some of the tools have pictographs incised upon them, and what appear to be numbers. Inscribed tools and weapons are, however, far more common at Harappa, a fact which with others has given rise to the suggestion that this city is slightly the earlier of the two, though it is impossible to say whether it was also the first to be deserted. The reason for this custom of inscribing tools and implements will, of course, remain uncertain until the script of the Indus valley has been deciphered, but it is thought that the

hoard from Mohenjo-daro may have been temple or government property which was numbered to prevent theft. In ancient Egypt tools sometimes had numbers incised upon them for this very reason.

Bronze is used for figurines as well as for models of small animals, and the casting in most cases shows great technical skill, the method employed being the *cire perdue* or wax process, a technique well known in Sumer and ancient Egypt. A small bronze figure of a dancing-girl is a perfect piece of casting, while closely approaching it in excellence is a little figure of a buffalo (Pl. K, 7). No examples of beaten work have been found other than the utensils; but it is quite possible that this kind of work was used for larger pieces of statuary of the type found in Sumer and in Egypt, and that these pieces have not survived or, more likely, are still to be unearthed. In any case, there seems no doubt whatever that the metal-smith held a prominent place among the inhabitants of the Indus valley and had plenty of material on which to exercise his skill.

Lead was also known and worked, but only one leaden utensil, a small dish, has yet been discovered. Leaden figurines and animals are

also non-existent; in fact, this metal is usually unearthed in the form of irregular lumps. It sometimes occurs as an impurity in the copper and bronze, but the metal-workers seem never to have realized that if it had been used sparingly as one of the alloys of bronze, casting would have been considerably facilitated. Lead has been worked in India from very early times, and there is no doubt that ample supplies were available for the Indus Valley cities. It is, indeed, possible that much, if not all, of the silver used was procured from lead, the process of extraction being exceedingly simple.

Quite a number of stone mace-heads, either pear or lentoid in shape, indicate that this form of weapon was much in use. A hard, cherty limestone and alabaster are the most usual materials for the pear-shaped specimens, while the lentoid type is commonly made of hard, dark-green stone. The latter seems to have been the more popular, to judge from the number discovered, but no mace of either shape which bears any inscription or decoration has yet come to light.

Saddle-querns made from a hard, gritty stone have been found in great numbers at Mohenjo-daro, and were used for grinding

grain. These have a pronouncedly convex base, perhaps because this helped to set them firmly in the ground, in spite of the fact that models from both cities show that these querns were sometimes placed in large pans to prevent any waste of flour. The cereals known to the inhabitants of the Indus valley included both wheat and barley, for samples of these have been discovered which, although black and carbonized, were sufficiently preserved to be identified as *Triticum sphærococcum* and *Hordeum vulgare*. Other stones with large hollows perhaps served to prepare curry-powders, for the local labourers on the site declared that they used identical grinders for this purpose.

Stone palettes, usually of slate, have also been found, though flat, natural pebbles were employed for the same purposes. These are all of the plainest description, and appear to have been used for rubbing down colours, as traces of a red oxide have been observed on some of them. This colour probably had a number of uses, including the slips on pottery.

Stone weights are extremely common, and are almost invariably made of carefully polished, and sometimes veined, chert (Pl. K, 2). The cube is by far the most usual form, and weights

of this type have been found ranging from minute specimens to those weighing as much as 274·938 grammes. Spherical weights with a flat top and base come next in popularity, and of these, too, quite large sizes have come to light; a third kind is the barrel-shaped weight which is not unlike those that have been found in Egypt, Sumer, and Elam. Some weights of exceptional size—one being over twenty-five pounds—are conical, and have two converging holes in the top for the ring of metal or rope by which they were lifted.

Alabaster, limestone, quartzite, slate, and jasper are among the other stones which were used to make weights; but chert predominates and was always used for the cubical type. The stone was first roughly flaked into cubes, then rubbed down smooth upon an abrasive, and finally polished. No weight has been found with a number or any mark upon it, with the exception of one barrel-shaped specimen which bears two pittings, but these may only have been made to rectify its weight. Pebble weights are also known, but they are very rare.

Mr. A. S. Hemmy, who has examined the weights from Mohenjo-daro and also some from Harappa, states that the system used was

binary in the case of the smaller weights and decimal in the case of the larger ones, the succession being in the ratios 1, 2, $\frac{1}{3} \times 8$, 4, 8, 16, 32, 64, 160, 200, 320, 640, 1600, 3200, 6400, 8000, 12,800, and that the unit weight had the calculated value of 0·8565 gramme. The same authority is of the opinion that, with the possible exception of a very few weights, the Indus Valley system bears no relation to that of the Babylonians, and though one group of weights strongly resembles the ancient Egyptian *Beqa*, he regards them, nevertheless, as quite independent. Very few of the weights from Mohenjo-daro, considering the great number that have been found, were bad or fraudulent, a fact which shows that stringent trading regulations existed in the city.

The few examples of scales used with the weights are of very ordinary pattern, and consist of a bronze bar with suspended copper pans. Some earthenware scale-pans may have been toys made by children. Much larger beams, of course, must have been used with the heavy weights, but these were, no doubt, made of wood. There is no evidence that the steelyard was known.

One measure only has been discovered, and this merely a fragment, consisting of a slip of

shell marked with divisions of 0·264 inch, of which nine remain. The mean error of graduation on this scale is only 0·003 inch, and two different marks on it indicate that it was once part of a longer measure on the decimal system. Probably, in its original state the complete scale consisted of many pieces joined together by metal bands, and the choice of shell for this purpose was an excellent one, for it could neither warp, expand, nor contract in varying temperatures. It is certain that the decimal system of notation was also practised outside India at this time, or even earlier, as it occurs on the Proto-Elamite tablets and on others from Jemdet Nasr in Mesopotamia.

Certain pedestals, particularly well made and finished, are objects for which no particular use has as yet been found. These pedestals are usually hemispherical in shape, with a circular recess in the top, which is sometimes bored with holes; they are about six inches in diameter and three in height. The material used is either limestone, white or coloured, or alabaster, and some specimens are ornamented, one very fine one bearing an incised trefoil design which was once inlaid. As this pattern seems to have been sacred in the

Indus valley, it may be inferred that the pedestals were designed to support a cult object which was, perhaps, of perishable material, as it has not survived.

Whetstones are by no means so common in the Indus valley as they are, for example, in Sumer, and it is difficult to understand how the edges of tools and implements were kept in proper order. Possibly bricks were used for sharpening tools, for the few hones that have been found are not particularly well made and are mostly of slate, though sandstone specimens exist. The ends and edges of some of the whetstones suggest that they were more often employed to polish metal than to sharpen an edge.

A pottery candlestick (Pl. O, 5) provides an answer to the question how the houses were lighted; no dish or other receptacle has yet been found which, by definite marks of burning at the edge, can be identified as a lamp. It seems certain that some vegetable oil must have been used for lamps in the Indus valley, since lamps were undoubtedly known in neighbouring countries at that time; in any case, it is extremely interesting to discover that candles were also in use at such an early date.

It has already been mentioned that cotton was spun and woven at Mohenjo-daro and probably also at Harappa. The numerous spindle-whorls with rounded tops and flat, or slightly concave bases found in both cities show that the women, if not the men also, spent much of their spare time spinning the thread; the latter must assuredly have been cotton, for the majority of the spindle-whorls are too small and light to spin an elastic fibre like wool. Specimens have been unearthed made of pottery, shell, faience, or a vitreous paste, and when they are ornamented, which is rare, the patterns are extremely simple. Whorls are found with one hole, or with two or three holes for a split spindle, while some have a groove round the edge which was probably used for rubbing the thread.

The shell that was so largely used to make inlay, beads, and ornaments of various kinds was of a variety (*Murex chicoreus ramosus*, Linn.) that is common in the Indian Ocean and the Persian Gulf. A very efficient ladle with a handle could be produced by smoothing the rough outside of a shell and removing the interior core, and these utensils were much used in the Indus valley and also in contemporary Sumer. They probably served a variety of purposes,

and differed appreciably in size, ranging from under an inch to over nine inches in length. Simple shell dishes are not so common as the ladles; they may have been too valuable to be left behind when the city was abandoned.

Shell shapes were obviously popular, for certain pottery objects have been unearthed which are either round or rectangular in shape, but with convolutions inside like those of a shell. These have been identified as cake-moulds, and are of a type that are still being used in India.

Of especial interest are the rolling-pins of pottery or stone, expressly made for the little flat wafer-cakes that are even now so popular in India. There are pottery net-weights which are ring-shaped, very much like a small bracelet; similar rings have been found by Dr. Frankfort at Tell Asmar with the remains of a fishing-net still adhering to them. In date, the Mesopotamian net-weights are contemporary with those unearthed in the Indus valley.

Certain thin pottery plaques, rectangular in shape with a perforated lug at one end, may have been intended for writing-tablets. They are of small size, ranging from four to seven inches in length, and were doubtless once covered with a smooth substance from which

the writing could be washed, after the fashion of the wooden tablets still used in India.

Several round ivory rods—the largest nearly eight inches long—which are graded down to a blunt point, are still unidentified. These rods, which are well polished, are simply decorated at either end with an incised pattern filled in with a black pigment, and it is thought that the smaller sizes, at any rate, may have been used to fasten cloaks. Ivory was certainly not so popular as shell, perhaps because it was more expensive to procure, though there is reason to believe that the elephant was a native of Sind some 4500 years ago. Shell was certainly very popular, but it was, of course, impossible to make articles of any considerable size from it.

VI

ARTS AND CRAFTS

THE people of the Indus valley had a large variety of pottery, both decorated and plain. Practically all the ornamented wares are coated with an opaque, red slip, upon which various designs and motifs are painted with a thick black pigment. The clay used for both the plain and painted pottery appears to have come from the adjacent river, and was tempered with sand, generally containing a large percentage of mica, or lime in the form of fine particles, though quite large grains of this material were sometimes included. The pottery made in Mohenjo-daro differs very little in shape and mode of decoration from that of Harappa, and only in a comparatively few cases would it be possible to say definitely in which city a specimen was made.

The regular striations inside practically every vessel show that they must, almost without exception, have been shaped on the potter's

wheel. To judge from the customs prevailing in a village near Mohenjo-daro to-day, it seems likely that the men performed this process, while the women gave the finishing touches to the pottery and also painted the designs.

Although, being wood, no potter's wheels have yet been found, the kilns in which the pots were baked have survived; they are round structures, between six and seven feet in diameter, with a perforated floor upon which the vessels were laid. A wood fire was kindled in a space below this floor, fed from outside, and the smoke was carried away through a hole in the domed roof—though no kiln is sufficiently well preserved to retain this upper portion. The heating was well controlled, for much of the pottery is most efficiently fired; a few over-baked vessels have come to light, but these had retained their shape sufficiently to be put into use.

The slip used for so much of the painted ware is red ochre, which substance may have come from somewhere in the country or from Hormuz in the Persian Gulf, which at the present day exports an excellent variety of this material to India. After a jar had been shaped on the wheel, the ochre was painted

thickly over it, and when dry was carefully polished with a piece of bone or a pebble. This process resulted, after firing, in a beautiful, highly burnished vessel, which in first-class work has the sheen, colour, and appearance of red Chinese lacquer. The designs, some of which also occur on the pottery of other ancient countries, although others are peculiar to the Indus valley, were painted on this red surface with a brush before firing, the material used being a thick, black, or purplish-black, paint made from manganiferous hæmatite. The most popular design comprises a series of intersecting circles (Pl. O, 4), a pattern which does not appear on the wares of any other ancient civilization and which, it must be confessed, is somewhat bewildering to the eye when it forms the only decoration on a jar. Occasionally the circles are carefully drawn, the jar being first marked out with squares to ensure regularity; in the majority of cases, however, the pattern had obviously been drawn freehand, with the result that it sometimes became so confused that, were it not that perfect examples exist, the origin of the design would not be apparent at all.

Another favourite device is the tree pattern which is generally placed in metopes, or panels,

alternating with other motifs. Here again, some of the patterns are well defined, while others have so degenerated that they consist merely of vertical lines drawn at intervals to represent the trunks, while horizontal wavy lines between them denote the branches. A very common motif resembling a large comb occurs with solar signs and other devices, some of which are difficult to identify; another well-known design is the chess-board pattern formed of squares, black alternating with the red colour of the underlying slip. Triangles set in single, double and, more rarely, triple rows, some in alternate colours of red and black, form a very effective decoration when not repeated too often. Hatching, as a means of distinguishing one triangle, square, or other motif from another is very common, and appears perhaps to the best advantage in the scale pattern which is particularly well known at Mohenjo-daro. Thin borders or ribbon designs frequently run right round the jars to relieve the main decoration, while linked ovals, sometimes with hatched interiors, evidently copied from beads, ornament the necks of some of the vessels. Thicker borders are also well known, the interior of these being cross-hatched or decorated with roundels or oblique

strokes, the slope of the latter being reversed at intervals to avoid monotony.

Figures of animals, birds, snakes, or fish occur much more rarely than the conventional designs; the last two are especially uncommon. Panels containing other motifs alternate on a jar with those depicting animals like the ibex and the antelope, or various birds, the bodies being filled in with cross-hatching rather than entirely painted over, possibly to avoid a heavy effect. Figures of animals are generally associated with natural objects such as grass or leaves, while birds sometimes appear perched on trees, sometimes merely in association with them; an especially charming scene of this type shows two jungle-fowl, the ancestors of the modern domestic species, arranged in a setting of bushes. Only one painted jar has been found with animals *en file*, a scheme of decoration which was well known in both Elam and Sumer; but this single specimen is different in shape and in the type of clay used from any other vessel that has come to light, and is quite likely to have been an importation. No human figures occur on pottery from Mohenjo-daro, but a sherd discovered at Harappa has the figures of a man and child painted upon it.

It was seldom that the whole of a jar was ornamented in the manner described. As a rule, about a quarter of the larger vessels is undecorated, this being the part round the base which was probably concealed by the jar-stand or by the earth in which the jar was set. The smaller specimens frequently have a wide band round the middle or the shoulder, framed above and below by narrower painted lines, while other vessels, especially the very large ones used for storage purposes, are ornamented solely with broad horizontal bands of black or reddish-black, set in couples, which usually fill up the whole of the surface of the jar except for a small portion at the base.

The thick, lustrous red slip already described was not only used for decorative purposes, but also served to seal the pores of the pottery, and so to prevent undue evaporation. As the larger jars were mainly used for storing water, some process had to be adopted to prevent waste, and large vessels have been found which appear to have been water-proofed inside with a preparation containing a bituminous basis.

A somewhat rare type of painted vessel is decorated with manganese paint, the background being either a cream slip or the natural

light red, or buff, surface of the jar itself. Sometimes this paint has a distinctly reddish tinge, but for some reason unknown a pure red colour, other than that used for slips, was not favoured as a paint for monochrome pottery. Small vessels painted in polychrome occasionally come to light, but the colours used—red, black, green, and, very rarely, yellow—are, with the exception of the first two, very friable, and they were undoubtedly applied after the jar was baked. This kind of decoration occurs most often on a white slip, but sometimes white is used as a separate colour and the whole design is painted on the natural surface of the ware. Polychrome pottery is, however, very rare, and, apart from two badly damaged vessels, the specimens recovered are all in the form of small sherds, while the only devices now extant are the intersecting circle, the trefoil, and one or two plant designs, none of which resembles in any way the polychrome designs on the pottery of Elam or Sumer.

Polychrome pottery has, however, been unearthed at other sites in India, for Mr. Majumdar, in the course of excavations at Amri, a site about eighty miles south of Mohenjo-daro, found beneath a stratum of

Indus Valley date numerous wares where red and black paints had been applied on a pink or cream-coloured ground, while at Nal in Baluchistan, about one hundred and ten miles north-west of Mohenjo-daro, Mr. Hargreaves discovered painted wares in polychrome, in which one of the colours used was the same kind of green as was sometimes used by the Indus Valley people. The date of this ware has not yet been definitely established, for Mr. Hargreaves considers it to be earlier, and Sir Aurel Stein regards it as later, than that of the Indus valley, while a third authority, Professor Childe, declares it to be roughly contemporary with that of Mohenjo-daro. The polychrome wares from both Nal and Amri, particularly those from the latter site, provide some evidence that this type of pottery was made in India before the rise of the Indus Valley civilization, although the craft seems to have almost disappeared during the time of its prosperity. The polychrome wares found at Mohenjo-daro were certainly not used for ordinary purposes, and the Nal pottery was, it is thought, used solely for burial purposes, like the early painted pottery of Susa in Persia.

Before turning to other types of pottery, mention should be made of the fact that in a

village close to Mohenjo-daro painted ware is still being made for which the same colours and slips are employed as those used in the ancient Indus valley, although the actual shapes of the jars are quite different. In this village the potter uses an up-to-date type of wheel worked by the foot, in contrast to the primitive one spun by hand which still serves the purpose in many parts of India to-day and was almost certainly used in Mohenjo-daro, but it is interesting to note that he bakes his pottery on the open ground covered with fuel, whereas a very efficient kiln was in common use in the Indus Valley city.

Plain, undecorated pottery is more common at Mohenjo-daro than the painted ware, although the clay used for both kinds is the same. In fact, painted ware is more frequent in the lower than in the upper levels, showing that the craft was tending to disappear. As a rule, the plain pottery is covered with a cream or pinkish slip and, though a red slip was sometimes used, the ornamentation consists of plain black lines. A chocolate-coloured slip was occasionally employed on the upper parts of a certain type of jar.

Another kind of ware, which is rather more uncommon, is made of a grey clay that burns

the same colour and is generally coated with a thick black slip. This clay, unlike the ordinary type, rarely seems to have required a *dégraissant*; it has a peculiar soapy feel and, whether coated with a slip or not, is always carefully polished, the marks left by the polisher being usually in a horizontal direction. Although pottery of a very similar colour is known in Sumer, the date of the levels in which it is found is earlier than that assigned to Mohenjo-daro.

A type of pottery which is distinctly rare is always thin and unusual in shape, and is made of a compact, light pink clay which is not so porous as the ordinary red ware. It is still uncertain whether this ware was imported, or whether it was manufactured by carefully levigating the clay used for the ordinary ware in order to produce a finer paste.

There is nothing primitive about the pottery of the Indus valley, for the shapes are very varied and the technique advanced; indeed, the specimens are, almost without exception, obviously the work of people trained in a long and well-established craft. Few of the vessels, however, can really be compared with those of Elam or Sumer, although the tall offering-stand which has a base of trumpet form and a

shallow dish at the top resembles some found at Kish, Ur, and Fara in Babylonia. The Indus Valley stands, like those of Sumer, are made in two pieces carefully luted together, but certain bowl-shaped jar-lids with a projecting handle in the centre that occur at Mohenjo-daro have only appeared at Jemdet Nasr—a site antedating the Early Dynastic Period of Babylonia, which latter was contemporary with the Indus civilization.

Handles on the pottery are very rare; they appear either as a flat perforated lug or as a loop over the top, the former being found on small cups and the latter on beakers. This lack of handles must not, however, be regarded as primitive; handled vessels are known in very early times in both Egypt and Babylonia and, after falling out of use for a considerable period, they reappeared at a much later date. The spouted pottery of Babylonia does not occur in the Indus valley except for several feeding-cups with spouts obviously intended for small children; similar cups of the same date and shape have also come to light in Sumer. Little jars with very narrow openings were undoubtedly made to hold black eye-paint, and were made in bronze as well as pottery.

A very curious kind of pottery jar is one

ornamented on the outside with knobs in rows set closely together (Pl. O, 3). It is uncertain whether jars of this kind were actually made at Mohenjo-daro, as only a few have been unearthed; Dr. Frankfort has found similar ware at Tell Asmar in Babylonia which he regards as imported, and, what is still more interesting, the Tell Asmar examples come from a level of approximately the same date as that assigned to Mohenjo-daro and Harappa. Such discoveries as this have now occurred often enough to convince most authorities that our dating of Mohenjo-daro is correct within one or two centuries.

Another somewhat peculiar type of vessel is one which varies in height from one and a half inches to as much as twenty inches, and is usually in the form of a cylinder irregularly perforated all over with small holes. For some time no use could be assigned to these objects, but as Sir Aurel Stein has lately discovered one in Baluchistan which was filled with ashes, it is now obvious that they were intended to be heaters or braziers. Perhaps the very small specimens were used to warm the hands, in the same way as two oyster shells with a live coal between were used not so long ago in England.

The visitor to the museum at Mohenjo-daro is always struck by the number and beautiful workmanship of the many miniature vessels found on the site, which in some cases are less than half an inch high. Although pottery specimens are quite numerous, the majority are made of faience, and it has been suggested that they once held rare and costly scented oils. This is quite a tenable theory, although the presence of an exceptionally well-made miniature offering-stand with a top too flat to hold anything suggests that some of these minute vessels may have served as toys; but even in this case it is quite likely that the stand may have been used to distribute the scent.

Several small partitioned trays are too shallow and porous to be used for liquids, and there seems to be no doubt that they were cruets for the condiments and relishes of various kinds which are still served in India. A few of these trays have small handles to facilitate their being handed round.

Patterns incised on the pottery are definitely rare, and are found only on the inside of the base of certain deep pans and on the dishes of offering-stands; in the former case they must have had a utilitarian rather than a decorative purpose, and sometimes they appear

to have been impressed rather than scratched. A particular type of ware in which the light slip was partially removed with some instrument like a comb, so that the darker surface of the pottery showed through, may have been an importation. In any case the presence of this "reserved slip ware" at Mohenjo-daro is distinctly interesting, as it precedes the Early Dynastic Period at both Ur and Tell Asmar, which may explain its discovery only in the lower levels of the Indian site.

Small flat sherds cut with triangular incisions seem to be fragments of pottery boxes or stands, and this type of ornamentation occurs on some of the earliest ware of Egypt, Sumer, and Elam. The examples from Mohenjo-daro are, unfortunately, very small, but when this decoration is found at other sites it is mainly confined to the stems of offering-stands. It certainly has the effect of reducing the weight of the latter, and the theory has been advanced that the high Sumerian stands, which are of stone as well as pottery, were copied from the reed-stands of identical shape now often to be seen supporting the trays of sweetmeat-sellers on Indian railway stations and, more likely than not, were used in the market places of the Indus valley.

Pot-marks are not common at Mohenjo-daro, although more frequent at Harappa, and when found on the former site are scratched on the shoulders of large jars. In this case the marks take the form of characters on the seal-amulets, but, strangely enough, no potsherd is known with any long inscription upon it, unless very soluble ink was used that has vanished in the course of centuries. One sherd has, however, come to light at Mohenjo-daro on one side of which is roughly scratched the picture of a boat, and on the reverse a couple of pictographic characters.

The pottery of Mohenjo-daro almost without exception has plain flat bases, though some are very narrow. The few ring bases discovered are always associated with hand-made pottery, specimens of which are all small and, from their finish, appear to have been made and baked in the home. As before mentioned, most of the floors were made of hard earth or laid with brick, and were consequently quite unsuited for vessels with a rounded or pointed base. Where such bases do occur, as on some of the large storage jars, it is probable that special supports of wood or pottery were provided; pottery stands, which closely resemble those found in other

countries, are not, however, very common in the Indus valley. Some of the storage jars, as we know, were partially buried in the earth.

The contents of some of the large jars described above make it obvious that these vessels were frequently used as larders, their smooth, polished outer surface being an effectual barrier against rats. Other jars discovered under the floors in various houses served as receptacles for the family treasures, a very common way of storing jewellery in the East to-day; and, as before mentioned, the poorer people constantly employed large vessels as cess-pits when they were unable to afford a brick structure. Although jars have been found in Mesopotamia laid on top of one another to serve as vertical drains, this method of drainage never occurs at Mohenjo-daro, and the use of pottery pipes for this purpose, although not universal, was obviously found to be simpler and more adaptable. Even broken pottery had its uses, for sherds were used as scrapers, cut into round pieces for draughtsmen, and occasionally laid down as a porous layer beneath the floors of bathrooms.

It has been suggested that some of the smaller pottery jars may have served as drinking-vessels and have been broken after

use, according to the custom of some castes in modern India. There is, however, no evidence that the caste system existed in that country at the time of the Indus Valley civilization, and, moreover, only one type of jar has been found broken in large numbers. Jars of this kind average about six inches in height, have a pronounced, pointed base and deeply scored belly, and are certainly too large to be grasped comfortably in one hand. Though there is no direct evidence that the water-wheel was known to the people of Mohenjo-daro and Harappa, the shape and make of these jars certainly suggest that they were used on water-wheels; and this would, of course, explain why such a number were made and broken. Large heaps of this type of pottery, all badly fired as well as damaged, have been found close to the site of some of the kilns, and are undoubtedly throw-outs.

Only one specimen of a theriomorphic jar has come to light, and this is in the shape of a couchant ram with a deep hollow in the back, which may have served as an ink-well. Dual vessels, tripod jars, or those bearing figures of animals in relief, are all conspicuous by their absence, a state of affairs which the lover of unusual pottery cannot but regard as unfortunate.

The wares of the Indus valley possess in a marked degree that utilitarian aspect which is such a dominant feature of the architecture, and if the mentality of a people can be correctly gauged by the pottery they make, the people of Mohenjo-daro and Harappa must have been singularly lacking in imagination.

Clay was also used for other purposes besides making jars. Two traps, one of which was first shaped on a wheel, afford proof that small animals were caught by this means; probably the housewives of Mohenjo-daro were troubled by mice. A pottery cage containing a recess for food held some small animal or bird, and a description has been given in another chapter of the small model cages that have been unearthed, which seem to prove that both singing insects and birds were kept as pets.

The pottery drain-pipes already alluded to were made entirely on the wheel, as were the pottery wheels, spindle-whorls, and certain pottery bracelets. The great majority of the figures of deities, human beings, and animals were also manufactured of clay, a suitable material which was easily procurable near either city and which had the advantage of being ready for use when mixed with water. The employment of clay for many household

purposes besides pottery-making is always to be observed among those ancient peoples living near a great river which annually irrigated their land. Wood was no doubt extensively used as well, but all the objects made of it have perished, and, in any case, it requires a certain amount of skill in working, whereas even a small child can turn out quite presentable toys of clay, while the adult could make articles, not only for the use of himself and his household, but also for votive and other purposes.

With the exception of the beads and seal-amulets, which are beautifully made and carved, the standard of the stonework is not nearly so high as that of the pottery and metal-work, probably because stone was very little required, owing to the abundance of copper and bronze that was used in the Indus valley. No carved stonework of a purely ornamental nature has yet come to light; perhaps wood which has perished took its place.

Copper, if not bronze, seems to have been used from the time of the foundation of Mohenjo-daro, but whether this was the case with earlier cities of the Indus valley remains to be proved, and this can only be done when other sites, built on higher ground and out of

the reach of water, have been examined from top to bottom. It is, however, significant that no worked stone tools or implements, beyond simple ribbon flakes of flint (Pl. K, 3) and several roughly chipped objects resembling celts, also of the same material, have been unearthed at Mohenjo-daro. If stone implements had been in general use at the time of the foundation of the city, some specimens would almost inevitably have been carried up to a higher level, but so far no Neolithic remains have come to light at either site.

Stone vessels are remarkably scarce, and, in addition, very few have been found undamaged. The majority take the form of shallow bowls, which are simple in shape, clumsy in workmanship, and carved out of the softer stones, such as alabaster, sandstone, limestone, or slate. A few more complex pieces, nearly all of which are alabaster, imitate the pottery, but their interiors are so badly bored that they cannot have been of much use as receptacles. A flat-based tumbler, a little over four inches in height, which was found with a hoard of copper and bronze, is made of the very rare, jade-green crystalline stone called fuchsite, a material at the present time to be found no nearer to

Mohenjo-daro than Mysore. In spite of the rarity of the stone, no special care seems to have been taken with this specimen, for it is definitely out of shape and bears quite plainly inside it the marks of the drill that was used to bore it.

The drill used for boring and shaping the interior of these bowls was very much the same shape as the flint drill used in early times in Egypt, being shaped somewhat like a Boeotian shield in form, with the upper face nearly flat and the reverse convex, while the two rounded ends are pronouncedly bevelled. A forked stick, fitted into recesses on each side of the drill, permitted it to be twirled round and round, while sand or emery served as an abrasive. It is possible to drill quite hard stones in this way. The interiors of the stone vases were drilled with a tubular drill, which has often left marks inside the vase itself; the cores drilled out of these vessels have frequently come to light.

The steatite statue described in another chapter is a creditable piece of sculpture, but it must be remembered that this particular stone is so soft that it can be cut with a knife. Other figures made of slightly harder stones, like alabaster and limestone (Pl. H, 1a), are

not quite so well finished, though they show more artistic merit, three of the best preserved statue heads from Mohenjo-daro being quite as fine as anything of the same date from Mesopotamia, although falling much below the standard of the Egyptian statuary of the Old Kingdom.

The eyes of all the stone statues made by the Indus Valley people were inlaid with stone or shell, a technique which also prevailed in both Egypt and Sumer. The arms of two of the best preserved statues, both of which are in a crouching posture with one knee raised, are shown as bent, with a hand resting on each knee. In one figure the arm has been partially freed from the body, a feature which is also to be observed in some of the Sumerian statues. Apart from these points of resemblance, however, and the fact that the waves of the hair are indicated, as in contemporary Sumerian sculpture, by chevron lines (Pl. H, Ib), the statuary of the Indus valley resembles that of Sumer very little. The nose, for instance, unlike that of the Sumerian statue, appears normal in size, and so does the mouth, which in the best examples is rendered quite expressive. The ear, however, proved a stumbling-block to the Indus Valley sculptor,

for in most cases it is a travesty of nature, although it was always carefully portrayed in Sumer. Another defect is the rendering of the forehead, which is much too low in all the statues, even if allowance be made for the possibility that a low, receding forehead was a racial characteristic of the inhabitants of Mohenjo-daro, which the evidence of the skulls by no means substantiates. Three of the heads are, at any rate, decidedly superior to any contemporary statue from Sumer, and certainly convey the impression that a greater demand for work of this kind would have led to excellent results. Two of the heads have enough character and expression to suggest that they were actual portraits.

A few of the stone figures of animals in the round, principally models of a short-horned bull, are of good, if not remarkable, workmanship, although the same animal made in clay is sometimes much more spirited and lifelike. A small figure of a mastiff in steatite is, however, extraordinarily realistic, the folds of skin on the head and neck being perfectly portrayed. The smaller stone figures are, in every case, superior to the larger specimens, probably because the steatite of which the former was made was far easier to work than the inferior

limestone and alabaster employed for the latter.

The seal-amulets are, however, the most successful artistic achievement of the inhabitants of the Indus valley, and the numbers of them which have come to light make it fairly certain that they were carried by practically the entire population of both cities. These amulets (Pl. M), which are invariably made of steatite, range in size from half an inch to just over two and a half inches square, although the most common sizes run from 0·7 to 1·2 inches. There are two main types, the first square, with a carved animal and inscription, the second rectangular, with an inscription only; and while the former have a small perforated boss at the back to take a cord, the latter are convex on the reverse side, with the hole running through the seal itself at right angles to its length.

The seals were cut into shape with a saw, then finished first with a knife or chisel, and finally with an abrasive. The carving of the figures and signs was done with a small chisel, a triangular burin being sometimes used for the inscriptions; and for certain details a small drill was employed (Pl. M, 5, 13), although it was never necessary to commence

a design with this tool, as was the case with the harder Sumerian seals. After the seal-amulet had been completed, it was coated with an alkali and then heated, which gave it its attractive, dead-white appearance and slightly lustrous surface. Apart from two cylindrical steatite specimens (Pl. M, 10, 11), both of Indian workmanship, the stamp seal was exclusively used at both the Indus sites.

Although "seal-amulet" is the most convenient name, it is uncertain whether these objects were much used for the former purpose, as sealings made from them are extremely rare. The particular specimens which have come to light are all of burnt clay, but it is possible, of course, that the majority of the sealings were made of mud, which has disappeared in the course of time in the same way as the mud-plaster has disintegrated on the burnt-brick walls of Mohenjo-daro. The pictographic inscriptions on the seals do not refer to the animal underneath, but seem to denote names and perhaps titles as well, although these are at present undecipherable.

Some of the animals on the larger and finer seals are beautifully portrayed, and though their conventional attitudes provide little scope for the expression of movement, much care

was lavished on the modelling. A specimen bearing the figure of a humped, or Brahmani, bull (Pl. M, 1) is a very good example of the fine work that could be produced. The muscles ripple under the skin in a most realistic fashion, and the well-nourished hump drooping at the back is also extremely well engraved, especially when it is remembered that all the work had to be done on so small a scale. A fragment of a larger seal with just the head and shoulders of a tiger is also a splendid piece of work, the open mouth, tongue, bared fangs, and careful placing of the double stripes being indicated with great fidelity.

Few of the smaller seal-amulets show such good workmanship, not on account of their size, but because objects of this type seem to have belonged to almost everyone, a fact which would necessitate a certain amount of mass-production. Even the more elaborate scenes, some of which have already been described, are not executed with particular skill; they convey the impression that the engraver was principally concerned with the task of portraying these religious episodes correctly.

Two boxes of steatite, one of which bears an incised chevron decoration, are divided

into compartments, and from their shape appear to be of foreign workmanship and probably importations from Elam or Sumer.

The use of powdered steatite to mould beads and other small objects is a practice that appears to be confined to ancient India, for it seems never to have been known in Egypt, and no objects made in this way have yet come to light in Sumer, although they perhaps found their way to the latter country, in view of the close trading relations that certainly existed between it and the Indus cities.

Considerable care was taken over the manufacture of some of the clay figurines and model animals, for though the former are primitive in appearance (Pl. I, J, 1), great attention had been paid, in many cases, to detail and finish. Both human and animal figures are covered with a red wash, or even with a smooth, polished red slip, this colour obviously having the same magical significance as it had in other countries. With the exception of some small clay masks, which were made in a mould and seem to have been intended to be sewn or attached to something, all the clay figures were modelled entirely by hand. The noses of the human figurines were made by pinching them out of the clay, the eyes were two small pellets of the same

material, while the mouth consisted of a small strip applied to the face and then deeply indented to indicate the lips (Pl. I). Dress and jewellery were portrayed by strips and pellets of clay which were sometimes slightly tooled to give a more realistic effect. The eyes of the animals are, perhaps, the best executed of all, for in this case a small cut in the head was widened very slightly, and in the incision a round pellet was inserted for the pupil, while the lashes were marked with a pointed tool; this last touch is only found on very well made figures. The rhinoceros was a favourite subject for the modeller, who placed strips of clay in appropriate places to represent the immensely thick skin with its horny bosses which is so characteristic of that animal. Some of the clay figures of animals are very poor, and may have been made by children, but the excellent workmanship of a great many seems to indicate that they were intended for votive offerings.

The extensive use of glazed and vitreous pastes in the manufacture of small ornaments and animal figures is a prominent feature at both Mohenjo-daro and Harappa (Pl. J, 2, 4). Steatite, both as the natural stone and also in the moulded form, was coated with a glaze

which in many cases has lost its colour owing to the salts in the soil, but which was originally blue or green. True faience is also well known, and consists of a base of powdered quartz mixed with some binding material, perhaps natron, and coated with a glaze. Another common material was a vitreous paste composed of quartz and a glaze mixed together and fired at a high temperature. This process results in a material with a firm, smooth surface and interior, which, though not possessing the glassy surface of faience, is stronger and more compact in every way. Disc-beads of glazed crystal or quartz, similar to some found in the early graves of Elam and Sumer, have also come to light, but whether these particular specimens were made in India or imported, as their rarity suggests, is not yet known.

It would be interesting to know where the manufacture and use of glaze first originated, for the former is a very elaborate process. It was almost certainly the invention of one country which later spread to others. India cannot, at present, claim to be the birthplace of this craft, for glazed beads and other objects, all of much earlier date than those found in the Indus valley, have been discovered in Elam, Sumer, and Egypt.

Fragments of pottery whose surface had been glazed, not polished, have come from very early levels at Mohenjo-daro, which is interesting in view of the fact that no glazed vessel of so early a date has yet come to light in Egypt, Sumer, or Elam, although a glazed pottery handle of Early Dynastic date has been found at Kish. Much more skill is needed, however, to apply glaze effectively on pottery than on the moulded ground quartz which forms the core of faience, and the surface of the pottery probably needed a certain amount of preparation before this could be done. Glass, as distinguished from glaze, is quite unknown at either Harappa or Mohenjo-daro.

Objects of extraordinarily fine workmanship made in faience and vitreous paste have been unearthed in the Indus valley. Among them must be mentioned two monkeys, the first a squatting figure with hands on knees (Pl. J, 2), which in modelling and finish has almost a Chinese appearance, the second an animal holding its young, which, although unglazed and in an incomplete state, promised to become a real work of art (Pl. J, 4). None of the moulds, by means of which the paste beads and some of the animals were made, have yet been found. Many of the animal figures,

which seem to have served as amulets, appear to have been first roughly modelled by hand and then shaped with a knife or similar tool, the glaze being, of course, the final process.

It has been mentioned in another chapter that the use of shell for inlay and small objects as in Sumer was a craft commonly practised at Mohenjo-daro and Harappa also. Curiously enough, mother-of-pearl was not at all popular in these two cities, and articles made of it are extremely rare, perhaps because it is such a brittle material to work, although the early Sumerians seem to have surmounted this difficulty. Several varieties of *conch* shells were worked in the Indus valley, the interior parts of the shell and the walls being employed in various ways; this hard material was first divided up with a saw, then the patterns for the inlay were first fretted out with a drill and finally finished with a chisel and file. The complete specimens present very much the appearance of ivory and are far better preserved, for they have not suffered nearly so much from the effects of salt in the soil. Ivory was, however, indispensable for certain articles such as tabular dice, hairpins, and the like, for which shell was too brittle and, moreover, not long nor straight enough.

A piece of ivory which once formed either the base or the top of a very fine vase has been found at Mohenjo-daro, and is ornamented with a design of intersecting circles in low relief, in which traces of the original red paste inlay still remain. The discovery of this fragment certainly indicates that ivory was used for larger objects, although it is, of course, impossible to say whether the whole of the jar was of the same material. Ivory was actually worked at Mohenjo-daro, for not only have a couple of tusks come to light, but several half-sawn blocks have been unearthed. It is strange that no animal or human figure made of this material has yet been found, for the fact that the elephant commonly appears on the seal-amulets (Pl. M, 6) shows that it was well known in the Indus valley and that ivory should have been easy to procure.

It has already been mentioned that cotton was used as a textile in Mohenjo-daro, and presumably over the whole area inhabited by the Indus Valley people. As markings on the robe of one of the statues seem to indicate embroidery (Pl. H, 2), it is probable that this handicraft was commonly practised, the period being much too early for printed cotton cloth of the type made in Sind to-day. Needles

of copper and bronze, sometimes with pierced eyes, sometimes with eyes formed by looping over the top of the needle itself, are well known, though in comparison with modern specimens they appear too clumsy to have been used on closely-woven material. A set of three gold needles, the largest two inches long, found with a hoard of jewellery by Mr. Dikshit, may have been employed in a special kind of embroidery; they all have cylindrical handles which terminate in a sharp point containing the eye. Two of these needles seem to have been held frequently between the teeth, to judge from the marks on the handles.

Awls of bone, ivory, and copper are quite common and, like the needles, doubtless had a variety of uses. They may have been used for fine matting, but none of this material has been preserved. A coarse matting, as I have said, was placed upon the beams of a room to form the ceiling.

Very few agricultural implements have survived, no doubt because they were almost entirely of wood. One or two roughly chipped objects of chert, not unlike unfinished celts in appearance and averaging in size 11 × $4\frac{1}{2}$ × 3 inches, have been discovered. These have double-sloped edges, and as they are much

too heavy to have served as weapons they are probably ploughshares, and were very likely quite efficient in the stoneless, alluvial soil of the Indus valley. Flint flakes, set in a wooden handle, such as the specimens found on early Egyptian and Sumerian sites, seem never to have been used, perhaps because copper was so plentiful and cheap. Two incomplete curved blades of this material from Mohenjo-daro are probably sickles.

Agriculture must have been one of the chief industries, for many large cities had to be supplied with food, as well as numerous smaller settlements. There is undoubted evidence that cotton, wheat, barley, melons, and dates were cultivated; seeds of the last four have been found and identified, and mention has already been made of the fragments of cotton cloth found with one of the hoards of jewellery. A great many other plants must also have flourished—for example, the lotus, whose seed capsules serve as a motif on pin-heads, and whose root is still eaten in parts of India to-day. The country seems to have depended on the annual floods for its irrigation, but there are no traces of canals through which the water could have run. This apparent lack of any preparations for dry seasons, together with the

representations of forest-loving animals on the seals, seem to point to the view that the rainfall in Sind and the Punjab must have been very much heavier than it is at the present day.

Boat-building must also be included among the crafts of a people whose chief interest was trade and who had, in Mohenjo-daro, a prosperous city close to a large and navigable river. A boat carved on one seal-amulet has no mast, a sharp, upturned prow and stern, a cabin in the middle, and a steersman seated in the stern. Certain markings on the hull of the vessel suggest that it was made of reeds bound together, a method of building which was used for quite large boats in ancient Egypt. Another representation of a boat is roughly scratched on a pottery sherd and resembles the first in that it is high at both ends and holds a steersman, but instead of the deck cabin in the centre, it has a mast with apparently two yards. The first type of vessel may have been exclusively used for river traffic and the second for both river and sea, but there is no evidence at present forthcoming that the inhabitants of the Indus cities were a maritime race, and such trading as took place between India and Sumer may have been carried by ships belonging to a third nation.

VII

CUSTOMS AND AMUSEMENTS

A VERY interesting aspect of the discoveries made in the Indus valley is the large number of toys and objects used in games which have been unearthed both at Mohenjo-daro and Harappa. Those that have survived are made of pottery, shell, and ivory, but wood must also have been largely used for this purpose, although it has, of course, long since perished. The favourite toy seems to have been a little pottery cart, to judge from the number of specimens, usually in a damaged condition, which have been found. These miniature carts are practically identical in design, on a small scale, with the farm carts seen in the villages round Mohenjo-daro to-day, and the presence of these toys in the city is ample proof that the full-sized vehicle was well known and in constant use in the Indus valley. No model which can be said to represent a war-chariot, or anything like it, has yet come to light, which supports the view that these people

were not war-like and were unthreatened by enemies until their civilization was nearing its end.

The children in those days seem to have enjoyed modelling in clay as much as the modern child, for numerous animals and figurines have been found which are so poorly made and baked that they must certainly be of childish workmanship. Small models of bulls have been discovered, some of them with the model carts, a fact which is evidence that this animal was used for draught purposes even in those early times, while the small seated clay figures unearthed from time to time were probably used in the ever-popular game of "houses." No dolls have as yet come to light, perhaps because they were made of perishable material. Rattles in the form of hollow balls of clay with pellets inside were common, some of the specimens being gaily decorated with lines of red paint. Hollow animals served this purpose as well, but they do not seem to have been so popular, probably because they did not stand such hard wear.

Little toy birds, a few of which are crudely coloured and most provided with stick legs, are quite well known, while a small model of a bird with its beak open—evidently singing

—in conjunction with some miniature cages which have been found, seems to show that song-birds were kept as pets. These cages occur in both cities and one of them has an obviously tame bird, perhaps a bulbul, coming out of the door, while other examples may have been intended to house a cricket or other chirping insect. A whistle shaped like a bird, by means of which various call-notes may have been imitated, was evidently very popular, while another favourite toy was a small animal climbing up a pole; up to the present the animal is still unidentified, but it was probably a common pet.

Little scale-pans of pottery, pierced at the edge with holes for suspension, have been found at both Mohenjo-daro and Harappa, and from their crudeness, these also appear to be the work of children. The making of model household vessels was also a favourite pastime, and some of the specimens have the finger-prints of the amateur potters indelibly baked in the clay.

More ingenious toys are the bull with a nodding head worked by a stiff fibre (Pl. K, 8) and the curious monkey-like animal with movable arms. Figures which ran up and down a string, and whose progress could be

accelerated at will by manipulating a cord, were evidently known, for some have been found with angular perforations for this purpose. The majority of these more complex toys are obviously not the work of children, and were probably made by professional toy-makers.

Several common games in the Indus valley involved the use of dice, of which both cubical and tabular specimens have been found. The former kind, which are like modern dice although considerably larger, were made of pottery or stone, the best examples being of really excellent workmanship (Pl. K, 6). Each side of these cubical dice has a number pitted on it, the numbers running from one to six, and so arranged that one is opposite two, three opposite four and five opposite six, contrary to the modern method of marking, where the sum of each pair of opposite sides is seven. Some of the pottery examples are considerably worn at the edges, but even so, they must always have been thrown on to something soft, as they are too fragile for rough usage. Sometimes the numbers were inlaid.

The tabular dice, which were invariably made of ivory, are marked with the numbers one, two, and three on three sides and have the

remaining side ornamented with longitudinal lines. Another method of distinguishing the sides was to incise various patterns on each, or more rarely, hieroglyphic signs whose meaning is, of course, unknown.

Although it is obvious from the markings that some tabular objects served as dice, others have been found of the same shape, or sometimes three-sided or cylindrical, whose use is still unknown. These certainly cannot have been dice, for they have the same pattern incised, either on each face or on the two opposite ones, and they may therefore have been casting-bones whose significance depended not on the pattern which came uppermost but on the manner in which the objects themselves fell after being thrown. These divining-bones, if indeed they did serve that purpose, are as commonly found as the dice, and in several cases have been found in groups of three.

It is not yet known whether the throwing of dice constituted a game in itself among the inhabitants of the Indus valley, but even so, it seems likely that they were used in other ways as well, for a number of objects have been discovered in both cities which are undoubtedly "men" used for the type of

board game in which dice seem indispensable. The appearance of these "men" varies considerably, some being coarsely made objects of clay, while the best specimens are made of hard stone, such as agate and chalcedony, and show the finest workmanship. The pieces are sometimes the same shape as the modern halma-man, but others are conical, with a smooth rounded top and sloping sides. It is interesting to note that no two stone gamesmen of the latter type have yet been found of exactly the same size, and for this reason they may not have been used for games at all, but may have been lingas, phallic symbols which are described in Chapter III. In the case of the halma-shaped pieces, however, four of the same shape, size, and colour have been found together, while another group consisted of three red, two dark grey, and one yellowish-pink. Another kind of piece, usually made of faience, is tetrahedral in shape and is especially interesting in view of the fact that identical objects have been found at an early level at Ur.

The boards on which the men were moved must have been made of wood, for none have survived, and the various positions may have been indicated on them by means of shell inlay, pieces of which have been found in some

of the houses. Many boards have been unearthed from early levels at Ur, but it is uncertain whether precisely the same board-games were played in the Indus valley, although it is extremely likely to have been the case.

Fortunately, however, a brick found at Mohenjo-daro is incised with rectangles in three rows of four, and this was evidently a game-board, or perhaps only part of one, as it seems to have come from a pavement. One of the squares on this brick is marked with crossed lines which may have denoted a "home," and if it is assumed that the adjoining end bricks, now missing, were similarly marked and that there were originally ten rows of three, the game played upon them would have resembled the ancient Egyptian game of *Sent*. If, on the other hand, there were originally twenty-six compartments, arranged with twelve in three rows at one end, twelve in two rows at the other, and two between, it would resemble a Sumerian board found by Dr. Woolley at Ur. The pavement of a house or courtyard would have been quite a good place on which to mark out a game-board, and many unprofitable hours were no doubt whiled away by the servants who cut this board.

Another brick has been discovered, but with one end missing, which seems to have been marked out for a game played with pebbles or beans. Four lines of shallow depressions, the best-preserved line having fifteen, are scooped out of one face of the brick; but there is nothing to distinguish one hole from another and the entire arrangement suggests a game-board used by various African tribes. Some of the African boards, which are all very similar except in the number of holes, are provided with compartments to take the forfeited pieces, and in the brick from Mohenjo-daro four holes standing apart from the rows probably served this purpose. This brick, also, may have come from a pavement.

Marbles were played in the Indus valley, but some of the specimens found seem too good to have been used by children, being extraordinarily well made of hard stones, such as jasper and agate. It is not certain whether the marbles were used by themselves as a game or whether little gateways figured in it, as they sometimes did in very early days in Egypt; but up to the present no other apparatus has been found with them. Certain balls of shell carved in relief with a circle design may also have been used in a game,

and it is evident that they were greatly valued by their owners, for in one instance a specimen was found with a hoard of jewellery buried in a metal jar beneath the pavement of a house.

A large number of small cones of hard-baked pottery, shell, or, more rarely, stone, are difficult to explain, but as the once sharp points of many of them are missing, they are likely to have been tools or play-things. Their small size makes it evident that they were not used for decoration, as were certain pottery cones from Sumer. It has been suggested that they are miniature ninepins and that the marbles that are found were used to knock them down. As many of these objects tend to rock when stood upright, this seems a very probable explanation.

In Chapter III, I suggested that dancing was perhaps included amongst the religious rituals, but that it also had a secular side is very probable. That dancing was accompanied by music is certain, for an elongated drum with a skin at each end is seen on two of the amulets. Another form of drum, or tambourine, appears to hang from the neck of one of the pottery male figurines. A pair of what are thought to be castanets have been found, and they probably

served to mark the rhythm of the dance, as among strolling Arab players of to-day. Also, if we are correct in identifying certain signs in the script as harps and lyres, we may surmise that at least one musical instrument of this kind was in common use, as in Sumer, where Dr. Woolley has succeeded in restoring the remains of several specimens.

The people of the Indus valley, or at least a large proportion of them, were undoubtedly flesh-eaters, for the remains of the stag, buffalo, pig, turtle, goat, and ox, and of various kinds of fish have all been found at Mohenjo-daro, although it is possible, as is mentioned later, that the horns of the first-named were ground up and used as medicine. The fowl was also domesticated, for its bones have been found in the Indus cities, but whether this bird is the same as the one that appears in the script is problematical, for the wild jungle-fowl doubtless once roamed the forests of Sind. It is in the large storage jars, sometimes used as larders, that the bones of oxen, sheep, and goats have mostly been discovered, but it is impossible to tell whether flesh was an every-day dish or reserved for special occasions. The fact that many of the animals, whose bones we have found, appear on the seals, and

therefore may have been sacred, does not preclude the possibility that they were sometimes eaten at religious festivals. A bronze figure of a goat tied by the neck to a stump undoubtedly represents a sacrificial animal, and, as I have already stated, that animal is still widely used for this purpose in modern India.

Some at least of the inhabitants of the Indus valley were fond of hunting, although perhaps few of the town-dwellers had opportunity to indulge in this sport. On two amulets men are shown in the act of shooting a large antelope and a wild goat with bows and arrows. To judge from the numbers of copper arrow-heads that have been found, especially at Mohenjo-daro, the bow must have been widely used; it is also carried by some of the figures in the pictographic script, as well as by a curious horned deity on some of the copper tablets. Small pellets of baked clay which have come to light may have been used in slings, or with a pellet bow, a weapon employed for bird-shooting by the modern Sindi.

It is not known whether dogs were used in hunting, but three quite different breeds appear among the model animals; the first with its tail tightly curled over the back and with lop ears, the second with an upright tail

and prick ears, and the third with a very short muzzle, almost like that of a bull-dog, but since the hind-quarters are missing from this model, we do not know the shape of the tail. Several roughly modelled clay figures have been found which represent a watch-dog tied to a post, others show this animal wearing a collar. A one-time sport in Sind was the worrying of boars by dogs, and, since this is also depicted on some very early seals from Elam, there are grounds for assuming that the boar was hunted in the same way in the Indus valley; indeed, the short-faced dog already described would have been eminently suitable for this purpose.

It is possible that gamecock fighting was a sport, for, as has been said, two jungle-fowls that appear on an amulet-seal are portrayed in a fighting attitude. If the partridge also was trained to fight it would not be surprising, for even now in Sind this bird is kept in cages for this same purpose. They were frequently brought by their owners to the excavations in cages decorated with blue beads as a protection against the evil eye; their defiant counter-calls were a sound that became associated with Mohenjo-daro. It is quite possible that the little pottery cages that we occasion-

ally find, one of which had a bird at its entrance, are actual models of partridge cages.

A certain amount of trapping would doubtless have been carried on; indeed, two pottery traps have been found at Mohenjo-daro. The large number of fish-hooks show that fishing was a regular occupation, if not a sport, both in the Indus, which was probably quite close beside the city, and in the large pools left by the annual inundations.

To eat their food the people of the Indus valley probably sat on mats round their dishes, though some of the richer folk may perhaps have used chairs and tables. Both of the latter articles have been identified by Mr. Smith and Mr. Gadd among the pictographs. These may, however, have been only used on ceremonial occasions, as even to-day in India quite wealthy people still prefer the floor. Whether knives were used at table is uncertain, though many have been found that could well have been used for this purpose; fingers probably took the place of forks. For spoons curious copper and pottery imitations of mussel-shells were used, and probably wooden ones also, which have perished. For drinking there were pottery cups of various shapes, and certain shell-ladles could also have been used.

Pottery stands consisting of a dish set on a tall pedestal with a wide base perhaps held many of the dishes of a feast.

Anciently Sind was probably as well supplied with fruit as it is in many parts to-day. Curries of various kinds were doubtless a favourite food, and stones for grinding the necessary spices are quite common in the Indus Valley cities. I have already mentioned certain pottery moulds that were used for making fancy cakes and the little rolling-pins for wafer bread, and we seem to be fully justified in the conviction that the people of the Indus valley had as large a range of comestibles as could be expected in such early times.

Some, at least, of their feasts must have had their aftermath, and there is some reason to suspect that the city-dwellers suffered as much from digestive troubles as do the modern Indians. Apart from local simples, the properties of which were doubtless known to most housewives, other medicinal ingredients were used. The many horns of the Sambur deer found at Mohenjo-daro are unaccompanied by the other bones of that animal, and Colonel Sewell has suggested that these horns were powdered up and used as a medicine, a purpose which powdered stag's horn serves at the

present day in India. A black substance of which specimens have been identified as *Silajit* is still in use in India as a specific for dyspepsia and diseases of the liver and spleen. It exudes from rocks in the Himalayas and is brought down by hill-men into India. At a site in Sind named Othmanjo-Buthi, which dates from the Indus Valley period or a little earlier, Mr. Majumdar found several cuttle-bones stored in pottery. This substance serves a multitude of uses in the Ayurvedic system and, as Dr. Prasad has explained, it enters into the composition of various digestive salts as well as being used for diseases of the ear, eye, throat, and skin.

VIII

CHRONOLOGY AND CONNECTIONS WITH OTHER COUNTRIES

As the reader will, no doubt, ask himself how it has been possible to assign any definite date to the Indus civilization, it may be interesting at this juncture to go further into a matter which has already been briefly touched upon in Chapter I, and to explain how it is that the excavations in Mesopotamia during the last fifteen years have supplied the key to early Indian chronology.

Since the present excavations in Mesopotamia were commenced, a number of seal-amulets of undoubted Indian workmanship have been found at various sites, but the *loci* of these, unfortunately, could not be accurately dated until Dr. Frankfort, in his excavations at Tell Asmar, discovered a seal in a stratum to which it was possible to give the date *c.* 2500 B.C. Shortly before this discovery, the writer compared a decorated carnelian bead unearthed at Mohenjo-daro with some of identical material, shape, and mode of decora-

tion taken by Dr. Woolley from the Royal Tombs at Ur whose date was considered by their finder to be prior to 3000 B.C. (Pl. K, 5). It is usually somewhat difficult to give a definite date to beads, for they can be passed from one generation to another, or even washed out of graves and used again at a much later date, but in the case of the beads from Ur, the very important graves in which they were found would seem to make such a history extremely unlikely. It is now, however, quite certain that the carnelian bead from Mohenjo-daro, together with a second one lately discovered, comes from a level dating from 2750 B.C., or perhaps slightly later. But the most reliable evidence of the date of the upper levels of Mohenjo-daro still continues to be Dr. Frankfort's seal.

This seal is cylindrical in form and of a totally different shape from the majority of the seals found in the Indus valley; but as three cylindrical specimens have been found at Mohenjo-daro, all of them, it should be noted, in the upper levels of that city, it is probable that they also were sometimes used by the inhabitants (Pl. M, 10, 11). The Tell Asmar seal is, however, certainly of Indian workmanship. Not only are the animals upon

it Indian, the elephant, rhinoceros, and gharial, or fish-eating crocodile, none of which ever appears on Sumerian or Akkadian seals, but the style of the carving also is undoubtedly Indian.

Dr. Frankfort has also unearthed at Tell Asmar fragments of a pottery whose surface was ornamented with knobs or pimples of clay, a type that has not yet been discovered at any other site in Mesopotamia and which is certainly foreign to that country. This knobbed ware also occurs at Mohenjo-daro and is certainly the work of an Indus Valley potter; one of the vessels unearthed is a small replica of a type of storage jar in general use in the city (Pl. O, 3). There is, therefore, strong reason to believe that the Tell Asmar specimens were imported from India. The shapes of the Mesopotamian examples are, it is true, unlike any yet found at Mohenjo-daro, but as the latter are very diverse in form it is quite likely that something which tallies in shape with the Tell Asmar pottery may yet come to light. As is the case with the seals, about the same date can be assigned to the knobbed pottery found on both sites; peculiar heart-shaped pieces of bone inlay which have been found at Tell Asmar also correspond with

the shell inlay of the same date which was common both at Harappa and at Mohenjo-daro.

Another interesting piece of evidence is a fragment of a vessel of light-green steatite (Pl. O, 2) found in a low stratum at Mohenjo-daro. This has carved on it an unusual mat-pattern, which also occurs on Sumerian vessels unearthed at Tell Asmar, Kish, and, further east, at Susa in Persia (Pl. O, 1), and as the stone and its colour also correspond, it seems certain that the Indus Valley specimen is an importation from either Sumer or Elam. It has been possible to assign a fairly definite date to the examples discovered at Tell Asmar, which belong to the beginning of the Early Dynastic Period—about 3000–2550 B.C.; and those specimens recovered at Kish and Susa have been assigned to about 2800 B.C.

Other objects found at Mohenjo-daro or Harappa—for example, beads of unusual shape—can be linked up with countries further west, such as Egypt, Crete, or Greece. It is at present doubtful, however, whether India had any direct trading connection with these civilizations farther west so early as the third millennium B.C.; perhaps their existence was not even known at that time to

the dwellers in the Indus valley, though commodities seem eventually to have reached them from India; as evidence we have a framed Greek cross with a linear cross in its centre, which apart from added ornaments resembles that on the seal in Pl. M, 5, appearing on a seal from North-east Greece, dated to Neolithic times. It is true that these framed crosses are also known in Elam, but no earlier than in India, and the fact that they are much more common in the Indus valley suggests that they originated there. A peculiar form of the same cross, with stepped edges, is well known at Mohenjo-daro and in Sumer and Crete, where they were used as inlays for pieces of wooden furniture. A motif of concentric squares that may have been magical, found at Tell Asmar by Dr. Frankfort, is duplicated on the Indus Valley seals, as their finder was the first to point out. Intertwined designs also were popular in India, Sumer, and Egypt, and seem in every case to have had a talismanic significance.

The roundel design which fills up the blank spaces in the seal in Pl. B, 5 is of great interest, for Mr. Gadd has shown that Indian seals found at Ur are decorated in this manner, but on the back instead of the face; and

though not all these seals can be accurately dated by the nature of the strata in which they were found, quite a considerable proportion were unearthed in Sargonid or pre-Sargonid levels and therefore agree with our Indus Valley material in date. In discussing these seals Mr. Gadd suggests that they may have been made in another Indus Valley city, which is very probable, since there are many deserted sites of the Indus Valley civilization in Sind.

The hemispherical copper or gold terminals of some of the strings of beads found at Mohenjo-daro and Harappa (Pl. L) are a shape that is at present unknown in Sumer. Terminals similar to these were, however, known in Egypt, but only at the time of the Old Empire, a period roughly contemporary with that of the upper levels of Mohenjo-daro. A pottery candlestick is also paralleled in Egypt by several of the same shape and about the same date (Pl. O, 5).

Another very interesting comparison is the use of imitation mussel-shells of slate and aragonite in Egypt, whereas in India they were made of copper and pottery. These imitation shells seem to have served as spoons, and they all have a hole in the edge either to

take a cord or to allow of the attachment of a handle.

There is perhaps some slight resemblance between the statuary of Sumer and that of Mohenjo-daro. The men wore their hair in the same way, *i.e.*, gathered up in a bun at the back of the head and secured by a silver or gold or woven fillet worn round the fore-head; and on one supposedly portrait-head from Mohenjo-daro, a pin is represented as stuck through the bun. On these statue heads the upper lip is shaved, a practice that was also common in Sumer (Pl. H).

The only evidence which has yet come to light which suggests that the products of the Indus Valley cities may have been carried west-wards by sea is the picture of a masted boat scratched on a potsherd; but this may re-present merely a river vessel. In spite of the lack of corroboration it is quite probable that the sea-route was extensively used, as it would have been possible to put in for water at several places on the shores of Baluchistan, although that coast is generally inhospitable. At the present day a considerable amount of trading is done by vessels sailing from various western ports in India to the Persian Gulf, and even direct to Aden, journeys which might

well have been performed in ancient times, for the ships then in use could hardly have been much smaller or more primitive in appearance than some of those that make the voyage now. Egyptian shipping was known in the eastern Mediterranean as early as the Old Empire, and there is no reason to doubt that during that period, which is contemporaneous with the Indus civilization, foreign sailing ships, and even galleys, visited the north-western coasts of India. It is not possible to say definitely what nations took part in this sea traffic. Indians may have done so, and also Babylonians, as they are supposed to have been good sailors—at any rate in later times. The greater part of the coastal trade today is, however, in the hands of Arabians, and it may be that they were already the chief navigators of the Indian Ocean in those early times.

On the other hand, there are strong reasons for thinking that the various land routes through Baluchistan were extensively used for trade purposes. Sir Aurel Stein has clearly shown that the population of that country was once far greater than it is now. Under the present rainless conditions it can support only a very limited population, but the number of deserted settlements shows that in ancient

days the valley population was quite considerable. For reasons that I have stated before it is quite possible that the Indus Valley people had little or no political influence over that country, though it is quite likely that certain tribes who were naturally well acquainted with its difficult terrain were employed as carriers.

Imports to the Indus valley from other parts of India make it clear that the people of the Indus Valley cities traded with, if they did not control, much of the country. For instance, stag's horns were brought from Kashmir; semi-precious amazon-stone came from the latter place or from the far-off Nilgiri hills; jadeite, as Sir Edwin Pascoe suggests, points to communications with Central Asia, and gold to Southern India. Mysore supplied a beautiful green stone of which a cup was found at Mohenjo-daro; and lapis-lazuli and perhaps a lead ore containing silver were brought from the further regions of Afghanistan. We can visualize caravans constantly entering and departing from the wealthy cities of the Indus valley laden not only with commodities in daily demand, but also materials to make objects of vertue to delight both merchant and client.

As might be expected in a city whose principal interest was trade, the population of Mohenjo-daro seems to have been distinctly cosmopolitan in character. The amount of skeletal material unearthed is not large, and, moreover, a good deal of that found was obviously not properly interred, as the remains, of all sexes and ages, were found in contorted positions. In spite of this, Colonel Sewell and Dr. Guha have identified no less than four different races: the Proto-Australoid, Mediterranean, Mongolian, and Alpine, although the two latter are represented by only one skull of each type. The Proto-Australoid and Mediterranean types, which form the majority of the specimens discovered, must have belonged to a big-brained, dolichocephalic people, and they agree in many ways with skulls found by Dr. Woolley at Al 'Ubaid and by the writer at Kish.

The finding of the single Mongoloid skull is distinctly interesting when considered in relation to the discovery of several terra-cotta figurines, some with horns, which are definitely Mongolian in appearance and facially quite unlike the ordinary specimens. These were unearthed at a very low level of the city and suggest that there may have been a Mon-

golian strain among the people, possibly introduced by immigrants from the north-west—perhaps from the Iranian Highlands, where a number of Mongoloid skulls of very early date have come to light during the excavations at Tepe Hissar in Damghan. On the other hand, too much emphasis must not be laid on the discovery of the one skull, or even the figurines, as the latter were all found in one part of the city, which may have been merely the quarters of a small Mongolian community. It is quite feasible, however, that a considerable amount of trade was carried on with certain peoples of Central Asia as well as with the countries nearer at hand.

Before closing this chapter it must be mentioned that, from the measurements made of skeletons of Mediterranean type found at Mohenjo-daro, it has been estimated that the height of one male when alive was about five feet four and a half inches, whereas two females was four feet nine inches, and four feet four and a half inches in height, respectively. The measurements of a skeleton of Proto-Australoid type show that the individual was five feet one inch in height, which, as Colonel Sewell remarks, is about the average for a member of that race. It is not possible with-

out further data to say definitely that the entire population of that city were of such small stature, but the fact remains that many of the houses are obviously built for short people. Where beam-holes are preserved in a wall it is noticeable that in many cases they are less than six feet above the floor; many of the doorways, too, seem unduly narrow for people of the present average size.

PLATES



PLATE A



(a) View of Stupa mound, from S.W.



(b) Great Bath at Mohenjo-daro, from N.

PLATE B



[*Archæological Survey of India.*

(*a*) Building with small bathrooms, north of Great Bath, showing passage and drain, from W.



[*Archæological Survey of India.*

(*b*) Well-head in paved floor.

PLATE C



(*a*) Remains of drain that emptied the Great Bath.



(*b*) Covered brick drain down the centre of a street.

PLATE D



(*a*) One of the principal streets of Mohenjo-daro populated to show its width.



[*Archaeological Survey of India*

(*b*) Skeletons on stairway leading down into a well-room.

PLATE E



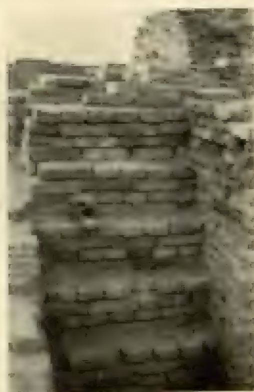
(*a*) Partially excavated well.



(*b*) Side street.



(*c*) Street with repairs in wall on right.



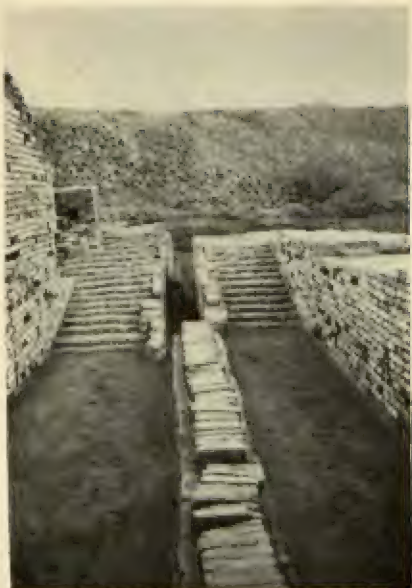
(*d*) Stairway, showing high, narrow treads.

PLATE F



[*Archæological Survey of India.*

(*a*) Room of large building with carefully paved floor.



[*Archæological Survey of India.*

(*b*) Double stairway with later drain running between.

PLATE G



[*Archæological Survey of India.*

(*a*) Western side of large house, showing original and later doorways.



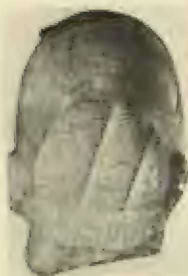
[*Archæological Survey of India.*

(*b*) Extended view of recent excavations at Mohenjo-daro.

PLATE II



1a



1b

1a and 1b. Limestone head, showing arrangement of hair.



2. Steatite statue wearing ornamented robe.

(*Archaeological Survey of India.*)

PLATE I



1. Pottery figure of mother-goddess.



2. Bearded male figure; pottery.

[*Archaeological Survey of India.*]

PLATE J



1. Pottery figure of horned deity.



2. Glazed figure of monkey.



3. Steatite pectoral, once mounted in metal and filled with inlay.



4. Unfinished figure of monkey and young.

(Archæological Survey of India.)

PLATE K



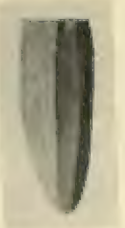
1



2



3



4



5



6



7



8

1. Ivory comb. 2. Chert weight. 3. Chert flakes. 4. Chert core. 5. Etched carnelian bead. 6. Stone die. 7. Bronze buffalo. 8. Pottery toy with movable head.

(Archæological Survey of India.)

PLATE L



[*Archaeological Survey of India.*

Girdle of long carnelian beads separated by spacers and beads of gilt bronze.

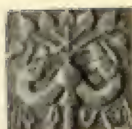
PLATE M



1



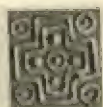
2



3



4



5



6



7



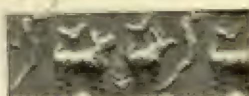
8



9



10



11



12



13



14

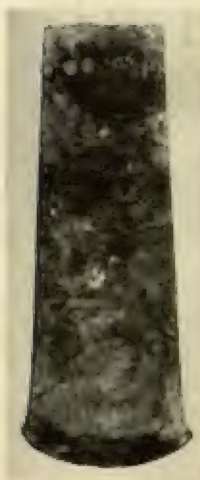
Steatite seal-amulets and cylinder seal.

(Archaeological Survey of India.)

PLATE N



1. Bronze axe-adze.



2. Bronze blade-axe.



3. Bronze mirror.

(*Archæological Survey of India.*)

PLATE O











1. Double steatite vessel from Susa in Louvre. 2. Fragment of steatite vessel. 3. Knobbed ware. 4. Painted pottery jar with intersecting-circles design. 5. Pottery candle-stand.

(*Archaeological Survey of India.*)

PLATE P



1. Copper razor. 2–6. Pottery and stone gamesmen. 7. Stone mace-head. 8. Broad-tanged chisel. 9. Copper arrow-head. 10. Copper fish-hook. 11. Copper blade-axe. 12–18. Types of pottery. 19. Pottery food-stand. 20–21. Large storage jars.

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C/o T. P. Bhattacharya
Time ~~Clerk~~ Keeper
Carriage & Wagon Shop
N. W. Rly
Moghal Pura

